

UNIV. OF
TORONTO
LIBRARY





Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

APRIL, 1904

Number 61

METHODS OF CONTROL IN PICTORIAL PHOTOGRAPHY

Again and again, in these pages, we have urged a continual remembrance of the fact that the negative is not the end and purpose of photography, but simply a means to that end, which is always and invariably the positive or print. It is passing strange that so obvious and indisputable a fact should be so generally overlooked or disregarded; but so it is. Neglect of the print, *per se*, is the besetting sin of American photographers. Witness the prints in our personal collections—which never *are*, but always are *to be* replaced. Amateurs and professionals alike seem to exhaust their powers of imagination and invention on the technical perfection of the negative. When the print is considered, it is usually the choice of a printing paper which offers the chief difficulty. Do we not all recall the familiar boast: "A straight print from an untouched negative!" That there is an infinite range of interesting possibilities between fixing the negative and the final proof which sets the pace for all after-prints, is apparently forgotten. That the negative, however perfect in itself, is merely a

94662
22/1/09

theme admitting of many widely different interpretations, is something undreamed of by the majority of photographers.

The plain purpose of this little book is to remove this widespread complacency concerning the untouched negative and straight print, and to set up in the mind of the reader that divine discontent which inspires the pictorialist when he sets out to make the exhibition print which, in his mind's eye, will set him apart as one of the elect. With the aforesaid divine discontent, of course, the gentle reader will find a goodly supply of practical instruction in the how and why of controlling the print.

In an earlier number of this series, dealing with photography out-of-doors, it was pointed out that the camera can give us two distinctly different transcripts of what we see,—the mere report correct in delineation, with every detail which the eye gradually perceived as it roamed over the object; and another report which, for convenience, we will speak of as a pictorial report, faithful in all the essential characteristics of the object seen, but with its details so manipulated that instead of a map-like transcript we have an amount of sentiment in the picture which adds to our pleasure in it. We have the same thing in nature. On a clear day at noon we look from our window and see a delightful valley stretching as far as the eye can see; there is no haze, everything stands out clear and distinct; the near-by town, the farm-houses and bits of woodland here and there. It is a pleasant sight, but we turn away and it is quickly forgotten. We see the same scene when

the sun is low; purple mists hang about the valley, the long shadows and shafts of mellow light here veil and there illuminate the near-by town, and farms have lost their harshness of outline and everything is softened. The aspect of the scene is changed. It is the same view which we had at noonday, but with a new element added—mystery. We feel, rather than see, the beauty of the landscape, and though we turn away, yet we do not so quickly forget it; and, when the mind goes back to that valley in after days, we recall for a moment the clear view, but we linger over that other aspect which charmed as much by what it veiled as by what it revealed. So it is with our photographs; we can make them what we will, but if we get into them feeling, individuality, sentiment—make them recall not merely the scene, but the emotions which it originally called forth—we will have more pleasure in our work and in the results.

To understand this and to appreciate the other vital fact that the purpose of the photograph may so far modify the method of its production that the end determines not only the means, but also the way in which those means are to be employed, is to take a definite step forward in serious photographic work. It is from this point of view that Mr. A. Horsley Hinton has prepared what follows, for the helping of all those whose faces are turned toward the pleasures of pictorial photography, as an antidote to the dreariness of the commonplace photograph.—EDITOR.

Assuming that the reader has attained a reasonable mastery over the elements of the process

(and he has no business to think of any special application until he has done so), the making of a photograph, whether for the mere amusement of its making or for the purpose of preserving a record of some fact, involves only the practice of certain manipulations in accordance with the set rules which he has learned. If the end is simply the satisfaction of making something, producing a photograph with no ulterior motive, then the acme of success will consist in having followed the rules implicitly. If the purpose be to produce a likeness of some thing, some incident, or place, then again it were safer not to interfere with the almost automatic performance of a process which, in its ability to accurately render form and detail, is well-nigh perfect.

**The Parting of
the Ways** But when photography is used for what is commonly called pictorial purposes the case is altered. It is no longer desired to exhibit the technical excellences of the process. The mere fact that the photograph is a true representation, or that the thing represented is interesting, beautiful or unusual, is a matter of secondary importance. A picture is a personal matter; it represents nature as seen with all the preferences and *penchant* of the producer; and, as the camera and lens have no preferences, and can only be induced to comply with the leanings of the user to a limited degree, it follows that the picture-maker (to use an unfortunate if convenient term) may have to control or modify the entirely impersonal process in order to produce the scene as his temperament made him see it.

Perhaps the majority of photographers have no

particular preference, and exercise no imagination, when looking upon a scene. It has never occurred to them that there is anything better worth doing in pictorial art than to make a facsimile of nature, and hence they congratulate themselves upon possessing a process like photography which, in this respect, excels all others.

As a matter of fact, however,
An Illustration this very accuracy, this indiscriminating and unbiased representation of every detail with equal fidelity, is perhaps the chief argument against employing photography for pictorial purposes. We find a parallel in the personal playing of a pianoforte and the mechanical performance of a barrel-organ; the latter, although faultless in its execution, prohibits the possibility of a personal interpretation or such accentuation of a note or passage which, it may be, is due only to a momentary impulse.

The person who is naturally gifted with feeling, together with an aptness for playing, we call "musical," and in such a one, as note follows note and the harmony develops, the emotions are stirred, and the imagination leads to this or that passage being emphasized or softly suppressed in dying cadence,—putting "feeling" into it, as we commonly express it, which really means that the player, led on by imagination, is playing the piece as he feels it; and not the manipulation, the touch alone, but the very character of the expression, makes his rendering personal, and distinguishes it from any one else's performance of the same piece.

I am anxious not to dwell over-long on this

preliminary explanation of the motives which may necessitate "faking" the photographic print, more especially because I shall later on have something more to say on the coöperation of imagination and knowledge in the production of a picture; but it is as well to run over these preliminaries, in order to start with a clear idea that in pictorial photography the sole purpose of controlling the photographic image is that it shall better represent the personal idea of the scene.

Personality in Interpretation It must be remembered that probably no two people possessing natural sympathy for the beautiful in nature see the same thing in precisely the same way. To each some feature or effect appeals more powerfully than the rest, and instinctively, in depicting his impression of the whole, each will exalt with subtle exaggeration that which moved him most. To the fact that, unaided and uncontrolled, the photographic process is incapable of producing what is, after all, an unreal aspect, existing only in the individual's brain, it is due that photographs are so often disappointing and fall so far short of one's ideal.

To Critics There are those who maintain that to interfere with the orthodox procedure of the photographic process is to rob it of its distinctive qualities, and make it no longer photography; but it may be had in mind that in such instances, when the photographer has considerably modified the mechanically formed image, he could not have secured his result but for the photographic foundation, and hence for want of a new and descriptive term we may still

call the product a photograph, though not offering it as an example or specimen of what the process pure and simple can produce. Again, some deny the photographer the use of any tools or materials not included in the catalogues of the photographic merchant, and proclaim as unpermissible any course of procedure not prescribed by the text-books; which is at once to deprive the photographer of the artist's privilege to draw inspiration from all sources, and place under contribution all means and powers to attain his end. If intended as a demonstration of the whole gamut of photography's powers, then the purity and unmixed character of the print must be unimpeachable; or, if designed to record some object, an assurance of unadulterated character 's a guarantee of faithful and impersonal representation; but a picture (using the term in its restricted or eclectic sense) owns no authority but that of its creator, who makes it in satisfaction of his own impulses, using such means as his fancy directs.

The means to be employed are, however, limited to such as by their nature, or the skill with which they are employed, do not betray their presence. Not that a clever deception may be achieved, the success of which might consist in the cunning avoidance of detection, but on the oft-quoted principle, *Ars est celare artem*, the means, method or materials should never be self-confessed, as is nearly always the case when water-color paint is applied to the surface of a photograph.

Whatever auxiliary is called in to assist in mak-

ing the photographic picture, it must be so done that its presence is never suspected,—a statement which might seem superfluous but that so many people are quite unable to detect the presence of alien means; and it is the scrutiny of the expert, and not that of the undiscerning, which must be the test.

Further, it is not only the actual execution which must escape observation, but the effect produced must be such as not to make even one intimately acquainted with nature suspicious of some artificiality. Hence, it may be concluded that technical skill, and knowledge of the processes employed, as well as an intimate acquaintance with nature, born of personal observation, are essential, whilst the picture-maker must himself be his own most intolerant and fastidious critic.

From what has been said in the foregoing, it must not be supposed that the present book will advocate, or even justify, what will be understood by hand-work on prints, working up, or touching up; these can only be regarded as a last resort to remedy or correct errors either of execution or judgment. On the contrary, an attempt will be made to explain such methods whereby in the course of production, whilst the work is in progress and approaching completion, it may be so guided and controlled as to fulfil its author's preconceived idea.

**Plates, Light-
Filters**

To commence quite at the beginning, it may be said that our choice of plate or film will influence to some extent the ultimate result. Thus I can-

not conceive of any pictorial worker failing to avail himself of the advantages which are offered by color-corrected plates and a light-filter or screen; or, rather, I should be inclined to put it this way,—that to correct the actinic inequality of the various colors in nature, two or three colored screens of varying intensity are essential, and consequently an orthochromatic plate, sensitized to suit the color of the light which filters through the screen. It comes to the same thing, of course, but putting it in this way will perhaps convey a clearer idea of the relative importance of the orthochromatic plate and the screen. The former can, of course, be used without the latter without any disadvantage, though with little gain; but the screen requires the orthochromatic plate to deal with its exceptional interpretation of the relative color luminosities.

In pictorial work, where we are less concerned with incident or the intrinsic interest of objects, but wholly occupied with the pleasing arrangement of light and shade, or of color contrasts which are rendered as light and shade, a false interpretation of such contrasts would wholly frustrate our endeavors.

Backed Plates The artist must be as little hampered as possible by technical limitations, and as the “backing” of a plate overcomes one shortcoming with respect to rendering intense contrasts and detail in high lights, without introducing any corresponding disadvantage, the photographer is handicapping himself if he does not benefit by the superiority of backed plates if glass plates are employed.

**Plates Versus
Films**

As was intimated in the opening lines, the means adopted, and the method of employing them, may be determined by the purpose or motive of the photograph; hence, although it may for the moment seem foreign to the immediate subject, a word or two should be said as to the relative value of films and plates in pictorial work. If we are going to enlarge for the final picture it matters little on what material the original negative is made; but for the final or enlarged negative I feel that glass, or a film or paper negative mounted on glass, which comes to the same thing, is necessary. In this I may be to some extent influenced by personal prejudice, having always had a preference for glass plates on account of the greater ease with which one can handle a thing that is rigid instead of flexible. My own method is to expose $6\frac{1}{2} \times 8\frac{1}{2}$ glass plates, orthochromatic, backed, and carrying two yellow screens of different intensity and one red one. From the $6\frac{1}{2} \times 8\frac{1}{2}$ negative I enlarge usually to 18×24 inches, and often larger, using a slow gelatino-bromide plate, but I do not wish to persuade any to do the same if any other procedure pleases my reader better.

**Practical
Work**

We now come to active operations. First, in all that takes place while the plate is in the camera,—that is, in selecting the viewpoint, in focusing and in exposure,—our operations must be influenced and guided, not so much by how the view now appears on the ground glass screen, as on what we think we can see our way to make of it, or how we are determined to modify it.

From the time we conceive a desire to control the picture and make it other than the mechanical process would make it, and having reconciled ourselves to the legitimacy of so doing, then all our operations become a preliminary wherewithal; and from the selection of point of view even to the ultimate framing of the finished picture, each step is determined by what is to come after, the whole procedure being a progressive sequence.

Example Thus, for instance, we may place the horizon line high up on the plate as in Fig. 1, because we there and then determine to unite the landscape to a cloud in another plate, as for instance Fig. 2, making in the end a result such as Fig. 3. This was referred to at some length in *THE PHOTO-MINIATURE No. 59: Combination Printing*, to which I expect to make several references later. We may, of course, include more on the plate than we require, because ultimately we intend to trim something off. We may be content with a poor composition if we foresee our ability to improve it later; we may admit a disturbing and unwelcome high light because we know that we can at a later stage suppress it, or accept and tolerate an ugly shadow mass, making a mental note to lighten it anon.

Focusing Again, in the matter of focusing we may determine on a degree of sharpness, which we may not approve of in the small whole-plate or other size in use, because we believe we are allowing something for loss of definition in the enlarged picture. In this there is great need for care, because the character which our focusing imparts to the original is the one

character of all others which survives, and which in subsequent operations we are least able to alter.

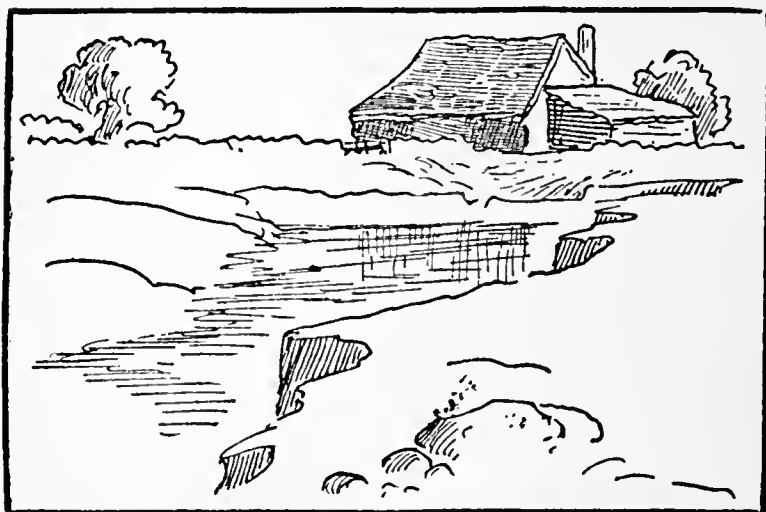


FIG. 1

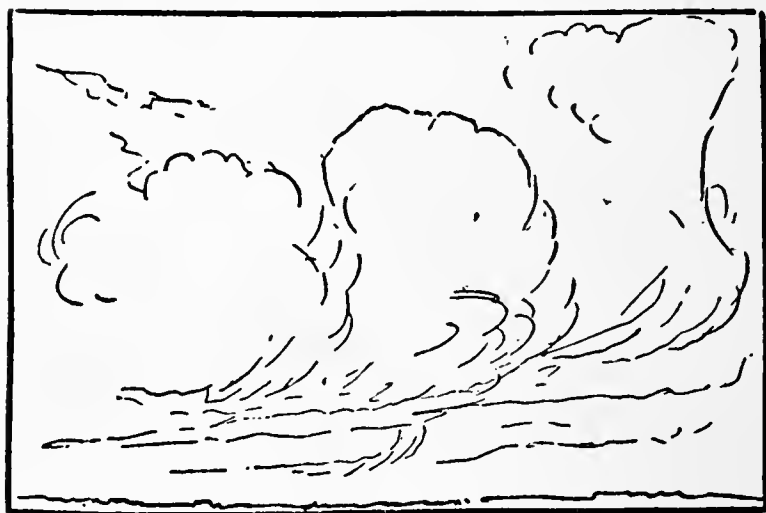


FIG. 2

The present is hardly the occasion on which to discourse on the use of the lens in pictorial work, and I only briefly touch upon the subject now

because to a great extent right focusing is like the line-laying of the foundation stone on which the superstructure is to be erected; moreover, as one studies the subject on the screen, and moves

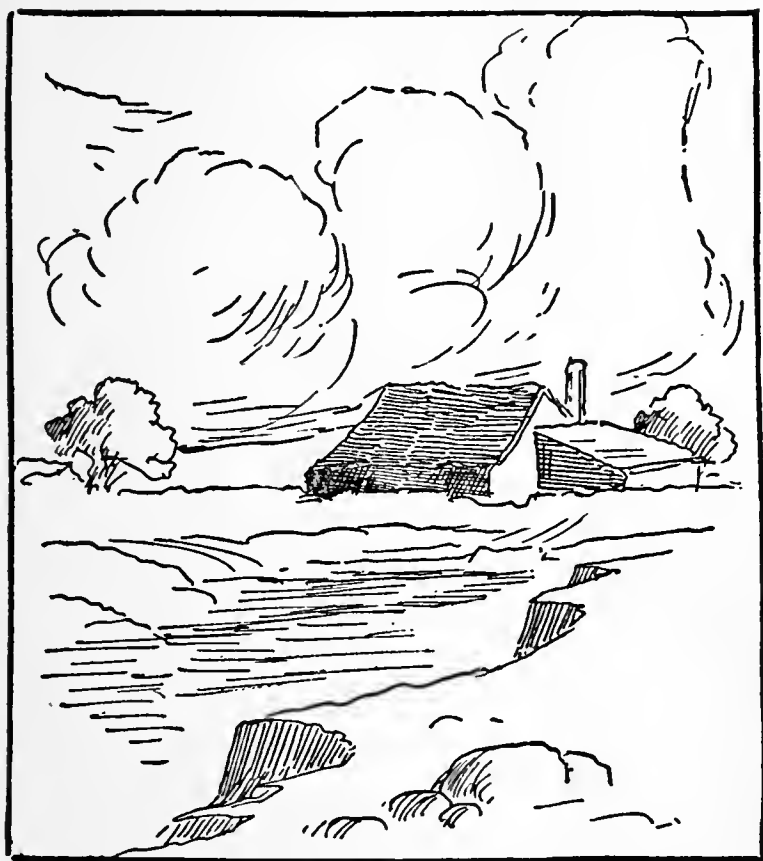


FIG. 3

the lens so as to focus first one plane and then another, stopping it down or opening it so as to vary the depth of focus, we are beginning to give our imaginative ideal a real existence. Hence the necessity for care in focusing.

**The Question
of Planes**

I will not pause just at present to explain this, but will intrude the general rule that the sharpest focus should be on the object which is destined to become the chief center of interest. If with the lens at open aperture you focus on some outstanding object such as a tree or post, the objects beyond being at a little distance, you will notice how the tree appears to detach itself and stand in relief, but probably the more remote plane is confused and structureless. As you insert smaller stops in order to increase depth of focus and bring the further objects into definition, you may note that you simultaneously seem to decrease the feeling of space between them and the tree, until with a very small stop all planes are sharp and do not seem to fall back one beyond the other.

In order to meet both parties to the continual controversy as to focusing, one might almost say that there is no objection to microscopical definition in every part of the picture if only a feeling or appearance of relief could be preserved, a sense of relief which makes the chief object of interest detach itself for chief attention. So one may formulate as a broad rule that the sharpest focus should be on the object of principal interest, with sufficient definition in other planes to prevent their appearing unintelligibly blurred, yet not so sharp as to destroy the feeling of separation.

Next, as to exposure and development, our treatment is directed by the fact that the result is not final, that certain subsequent operations must be allowed for; and the descriptions which will follow will

**Exposure:
Development**

explain why the negative must be kept very thin. A full exposure, therefore, and a diluted developer should be used. Intensification and reduction might be regarded as methods of control in making the picture, being means to an end, and the deliberate alteration of the character of the negative for deliberate purposes. In the present connection, however, they must be regarded as merely means of correction, because their office was not reckoned on when the idea of the picture, its effect, its contrasts, etc., was first conceived. On the other hand, local reduction or local intensification may be on a different footing, their object being to modify certain lights and shadows as we deemed they should be altered when studying the image on the screen. In this way intensification and reduction become part of our predetermined method, modifications which we allowed for and reckoned upon. But notice that they are only modifications of the negative, and, made in the course of construction, they are merely tentative and not in any sense final.

My reader who, not necessarily
Local Manipulation for pictorial purposes but for some other reason, has had recourse to local intensification, local reduction, or local development, will probably have retained a discouraging memory of the exceedingly risky nature of such processes.

If we attempt to apply a reducer with a brush, or the finger-tip, we are almost certain to produce a more or less well-defined line where the reducing action has ceased, and the normal density of the film begins. Doubtless this may be avoided with

extreme care, though, so far as my own experience goes, it is usually attended with disaster. Moreover, as we are working on a negative, it takes more than a little experience to tell the precise degree of reduction requisite to produce a definite effect when printed from, whilst with intensification it is perhaps worse, for unless the uranium method be employed we have the further complication of first bleaching and then subsequently blackening. If we have been careful to produce a thin negative with soft gradation but no very severe contrasts, something may be done by intensifying the whole image and locally removing the intensity. Thus we may have a subject containing, say, two or three very light patches, which compete in interest and produce a disturbing effect on the mind. If we make the negative so thin that these high lights are a long way down the scale of gradations, we may then intensify the whole, and, by locally removing this intensification from two of the contending light areas, leave one predominant because intensified and set the other two back to their original low-toned condition. This can be done by just using the ordinary mercuric chloride bleaching bath, subsequently blackening with an alkaline developer or ammonia (or perhaps preferably a 10 per cent solution of sodium sulphite because less energetic), and when the intensified plate is, after final washing, nearly dry, paint over the spots to be reduced with a weak solution of hyposulphite of soda. The instant the action is seen to have begun plunge the whole into clear water, remove and rinse under the tap, and observe what has happened, repeating this until

the desired degree of reduction has taken place. Presumably the same course succeeds with the mercuric iodide bath, whilst with uranium nitrate the removal of the intensification must be effected by means of very weak alkaline solution such as ammonia or sodium carbonate.

Areas of undesirable density can, as is well known, be reduced by rubbing down with absorbent cotton steeped in alcohol; but all these methods, and such others as are given in the text-books, will I think be voted by the pictorialist as exceedingly clumsy, limited, and far from being of the kind with which the worker can, as it were, feel his way little by little toward such modifications as he may desire.

A Different Way Instead, then, of a chemical or physical method, I am going to suggest a mechanical one, for which, although far from new or original, I may be able to describe fuller application than is usual.

Just as in local reduction of an intensified negative just referred to we first made a thin negative to allow for subsequent intensification and then restored certain over-dense parts to their original condition, so now we have first an over-thin negative and generally increase its density by coating it at the back with very fine matt varnish (note carefully that increase in general density or opacity is quite distinct from intensification), and then scrape away the varnish from those parts we wish to leave as they were before. By coating the whole with matt varnish we have not altered the relative density of any of the parts, and by printing for a little longer we shall

obtain a hardly distinguishable result, but we have made it possible to print some tones lower where the additional opacity has been removed. But between the added density of the matt varnish and the greater transparency of its absence, it is conceivable that an intermediate degree may be desirable; indeed, the edge of the varnish where it has been scraped away may well require softening



FIG. 4

off. This can be done by etching thereon with the point of a sharp penknife-blade or similar tool, employing a cross-hatching as is suggested by Fig. 4, in which the black portion represents where the varnish has been removed and the cross-hatching the "etching" or scratching designed to print as an intermediate tone. The cross-hatching produces in the matt varnish a sort of reticulated screen which interrupts the light less than does the unabraded varnish surface in proportion to the closeness of the scratches.

Following this out closely, it is conceivable that a complete scale of gradations from the full density of the varnish to the lower tones represented by the plain plate may be produced; and, in the other direction, the scale of tones may be raised by working with pencil or crayon on the matt surface, thus according to the amount of lead or pigment applied producing greater local opacity.

Here a precaution must be noted, **A Caution** and it is this. If a negative so treated be printed from on, let us say, gelatino-chloride paper in a tolerably strong light, the result will be rather disconcerting, the cross-hatching printing as cross-hatching and not as half-tone. This is merely for want of diffusion of the light, or, in other words, slower printing, a principle it may be worth while to consider for a moment, because it will recur at other times.

Diffusion If I hold my penholder horizontally and close to the paper on which I am writing I get a clearly defined shadow of it; the further I remove it from the paper the more diffused is the shadow image, the outline being softened. If, on the other hand, I place between the light and the penholder some such material as tissue paper, which diffuses the light,—that is, converts the one point of bright light (such as the lamp or candle) to a large luminous area,—the shadow becomes so indistinct that I cannot discern its exact outline; and if a number of penholders were held at a little distance from each other the shadows would merge one into the other. The lines of matt varnish left between the scratches act as the penholder intercepting the

light and casting a shadow, but the light must be diffused so that each shadow merges with the next adjacent, forming a continuous half shadow instead of disconnected sharp ones.

In Vignetting Precisely the same thing occurs when printing with a cut-out shape for vignetting. If printed in a strong light the shape of the vignette is registered as a sharp edge, but if the printing-frame be covered with several thicknesses of tissue paper the tint printed through the cut-out opening softens off imperceptibly. The matt-varnished back of the negative is only separated from the printing paper by the thickness of the glass, and, as it therefore cannot be retired sufficiently to give a soft shadow, the light must be diffused in this way by superimposing several thicknesses of semi-transparent paper.

A practical example of what may be done in this way I shall give immediately; meanwhile I want to call attention to another matter which seems to find fitting place here. The use of orthochromatic plates and screens has been almost insisted upon. The only drawback, if it can be called such, is that sometimes in the event of a gray clouded sky or a cloudless blue one, the sky portion of the negative prints a light tint, and before clouds from another negative can be introduced this semi-transparent sky must be blocked out; on the other hand, if the photographer possess a little natural artistic skill he may draw and shade in clouds with pencil on the matt varnish, and then partially scratch away to get darker printing. This, however, requires considerable skill and some practice.

**An
Illustration**

I am quite aware that to the photographic purist, though prepared to be indulgent, this may appear as an outrage, but I am here only concerned with the "how" and the "why." In Fig. 5, (among the engraved supplements), used in No. 59: *Combination Printing*, as an example of combining several negatives to produce a given effect, I now introduce an almost identical result produced in the manner above described. Here on the semi-transparent sky, with a print of the clouds desired before me, I began by shading with pencil on those portions which I desired should come lighter, as, for instance, the gleam of light under the rain-clouds and just behind the hill summits, and scratched away very tenderly a little of the varnish where the deeper shadows would come. Having carried this sort of work as far as I felt it safe to do in a negative stage, I made a contact transparency and matt-varnished the back. I now found the clouds generally suggested in accordance with the pencil shading and scratching. Having a positive image to work on, the clouds were easier to elaborate, only of course pencil shading produced shading and scratching the opposite or reverse of what had been the case on the negative. Finally, I took a contact negative from this, and I might safely defy any one to tell that any hand-work had been employed, at least so far as execution is concerned; whether the effect is true or natural I will not discuss.

In the original negative the foreground was uniformly lighted, forming a confused mass of scattered lights; so first the pencil was brought to

bear on the portion where now the light is seen concentrated, as it might be imagined to do, gleaming out between the rain-clouds and to left and right; the varnish was scraped away, in some parts more, in others less, and so the effect was gained. In justice to the little picture perhaps it may be said that the reproduction has been made from the enlarged picture, 18 inches by 24 inches, which was subsequently produced, and has suffered in the reduction.

This example may not be a very convincing one, and yet possibly it will suggest a way of overstepping the limitations of photography as usually practiced, and point to new possibilities for those who have at times felt that the photograph is such a poor representation of the scene from which the appeal it made to our emotions is held in such precious memory.

Possibly the reader may say, But why interfere with the photographically truthful representation at all? Well, for the present I am dealing with the "how," because I imagine it to be the real *raison d'être* of this monograph. The "why" of it will be dealt with presently. Meanwhile let it be understood that this wholesale tampering with the photograph is not to be done just "to see what we can make of it." No good can come of such haphazard procedure. All modification must be impelled by definite intention, and must have for its object the achievement of a very definite result.

In this extensive use of matt varnish above referred to, it will be seen that the end attained is a power to modify the relative darks and lights

so that we may emphasize or suppress certain parts or objects, and thus more strikingly convey our individual impression of the scene and secure a more orthodox composition.

I now suggest the substitution of tracing-paper or papier mineral for the matt varnish, and must refer my reader to the drawing-board method of printing referred to in *THE PHOTO-MINIATURE* No. 59: *Combination Printing*. In that book it was suggested that for the printing of large negatives, instead of a printing-frame, an ordinary drawing-

**The Use of
Tracing-Paper**

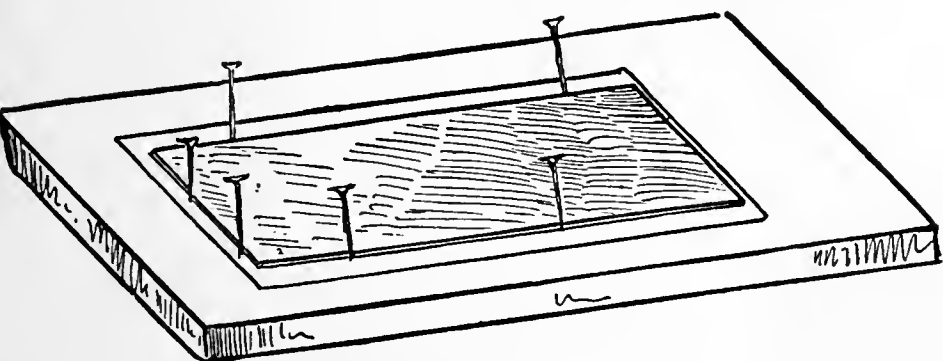


FIG. 6

board covered with felt should be employed, the printing paper, a little larger than the negative, being first placed thereon and the negative laid upon it; six stout pins, two on each of three sides, being placed so as to secure the paper to the board, and retain the negative in its position without the possibility of its slipping or moving, as shown in Fig. 6.

If the board be quite flat and the paper of not too obstinate a character, the mere weight of the negative may be relied on to secure sufficiently

close contact with the paper, probably not for as small a size as 10 x 12, but certainly for 12 x 15 and larger, always assuming that fairly good glass is used for the negative. Any difficulty in securing contact may be overcome by superposing a sheet of plate glass thick enough to give the necessary weight. The purpose of this arrangement for printing is that the printer has free access to the negative, which can be removed as often as desired, and on being replaced if it touch the six pins it must assuredly be in register, that is in exactly the same position as before. In like manner a sheet of glass, or another negative of exactly the same size as the first negative, may, if desired, take its place.

Since THE PHOTO-MINIATURE No. 59 was written, Mr. Nelson Cherrill has invented a printing-frame which achieves the same end, and, as pressure is also secured, it is applicable to small plates. (See Appendix.) The principle in either case is that successive printings on the same piece of paper may be made from different negatives or with different masks, with the certainty of getting true register every time.

The Method Let us see to what good purpose we may apply this. I propose that the negative to be printed from should first be coated on the glass side with fine tracing-paper. This is obtainable from most dealers in artists' supplies, and should be selected on account of the least amount of granularity. Papier mineral might be used with advantage on account of its structureless character, but for my own part I

find there is not sufficient freedom when using a pencil thereon, which we shall presently proceed to do.

Cut the tracing-paper a little larger than the negative to be covered, and pass it through water, thoroughly wetting both sides, and lay on clean blotting-paper. On the glass side of the negative paint a narrow edge of strong adhesive, such as fish-glue, or some one of the patent concoctions thereof. This edge should be about the width of the rebate edge of the plate. Then, having blotted off any excess of wet from the tracing-paper, lay the negative glass side down upon it, taking care that it adheres all around; raise the plate and paper together, and set on end to dry. The tracing-paper will probably show an abundance of creases and blisters, but as it dries these will disappear, until the paper is as tight as a drum-head.

We have now a tracing-paper surface to work on instead of matt varnish, and with crayon powder and stump for covering large areas, or BB black lead-pencil for finer work, this or that object, space or detail can be strengthened in a very effective manner. Should it be desired to reduce density,—that is, deepen a shadow or make a light tone print darker,—a solution of Canada balsam in turpentine may be applied with a brush, thereby making the tracing-paper translucent.

In this way Fig. 7 (see half-tone supplements) was altered to Fig. 8, where, instead of the flat, all-overish lighting of the former this has given place to the appearance of concentrated light in the cen-

Another
Illustration

ter, a strengthening of the shadows in some of the foreground details, a little more light in portions of the tree, and a slightly increased shade about the stems of the center cluster, and sug-



FIG. 9

gestion of cloud in the empty patch at the top right-hand corner. Flatness has given place to variety, which in itself may be supposed to better reproduce the impression which the rich masses of undergrowth and weeds in the sparkling light

of a summer's afternoon would have on the sympathetic beholder. The tracing-paper back of the negative in this case would present something of the appearance shown in Fig. 9, where the shaded part represents lead-pencil work, and the dotted parts Canada balsam.

Still there is something seriously amiss with this pictorially, and the fault probably lies in the inherent fault arising from indiscreet lens work, in the first place; and it will be remembered that in referring to this on page 11 it was stated that the character imparted by focusing is, of all others, the most difficult to subsequently change. In the present case the sharply focused foliage and grasses in the immediate foreground have a fidgeting, restless effect, which by a little less definition might have been prevented.

Subjects may occur, however, in which the foreground consists of multitudinous detail in such high light that, even if not very sharply focused, still thrust themselves disturbingly on the attention; such, for instance, as the newly unfolded fern fronds of vivid green.

Now, if the reader is not already
Sunning aware of it, I want him to notice
Down the marked difference between expos-

ing the print to light under a negative for a longer time than is necessary to produce the required depth, and exposing the print to light through a piece of plain glass or without glass at all. In the former case the lights and darks go on increasing in depth but preserving their relative contrast (at least up to a certain point), whereas if we remove the negative and expose the whole or a portion of

the print to light, the light details grow darker more rapidly than the darks gain in depth until the former catch up to the latter, and we get nearly a uniform dark tint. We may utilize this to do exactly as the painter does when he puts a wash on some part of his picture to "tone things down a bit," and thus get rid of too insistent detail. But to expose the print to daylight, merely covering the portion to be preserved with paper, or a cloth or the hand, as has often been suggested when "sunning down," I propose a more reliable and systematic way.

First make a rough silver print of your subject; on this place a sheet of glass the exact size of the negative, cover the glass with tracing-paper stretched tightly as before described, and, laying this on the silver print, draw in very lightly the chief features of the picture. No artistic skill is required for this, the operation being precisely similar to that which is done in a child's "drawing slate," in which the pencil traces on a piece of ground glass the print placed beneath.

Decide now what portions are to be toned down and which retained, and over the latter apply as thickly as possible the crayon, or pencil, as the case may be. There may be some portions which you wish to tone down only slightly, and these should receive a slight general shading, leaving the rest untouched tracing-paper. There will be some details to be lowered in tone even more; such, for instance, as little bits of light between the branches of trees, and these on the tracing-papered plain glass are gone over with the Canada balsam.

With here a touch of pencil, there a broad

stroke of crayon, and anon a touch of balsam, there is obviously room for the exercise of any degree of taste and judgment. When all is finished we have what may be called the mask or shader, a sheet of glass covered with tracing-paper bearing all sorts of strange marks and half-translucent spots, these markings and spots exactly coinciding with the portions of the print to be preserved, and the parts to be suppressed or lowered in tone.

We will suppose now that we proceed to make our serious print, the negative having received such assistance on the back as may have been deemed advisable. When printing has gone sufficiently far for us to see pretty well what will be the final result, we remove the negative and substitute the mask, or shader, and give a short exposure to light. The result will soon be seen. Those parts protected by the crayon work will remain unchanged, but the other portions will have become flatter and possess less contrast. When this has proceeded a little way, remove the mask and restore the negative to its position and continue printing. This, whilst bringing the print nearer to its required depth, will simultaneously have sharpened it up again and so we make a further exposure with the mask alone.

Thus, little by little, we build up the print with the precise amount of crisp contrast or "summed down" portions our taste directs; finally, we may deem it prudent to print through both negative and mask, placing the latter outside the former; this will arrest printing of the protected parts and permit the printing of those regions covered by the plain tracing-paper.

**A Third
Illustration**

In Fig. 10 (see engraved supplements) we have a direct print from a negative. The white spots of sky showing through the branches on the right had to be got rid of, the tangle of fern stalks to right and left of the foreground needed suppressing, as also some portions of the foliage, whilst the gaunt stem of the fir tree and its bent branches, as well as the group of ferns about its feet, seemed to call for emphasis so as to make them rivet the attention a little more forcibly. In Fig. 11 (see engraved supplements) something has been achieved by way of improvement, a mask having been used, the appearance of which would be somewhat like Fig. 12.

**A Fourth
Illustration**

Once grasp the idea of what this accentuation of tones and the shading down is intended to do, once realize what unlimited power of control this interchange of mask and negative gives, and there is practically no end to what one may do. In some cases I have employed two or three masks, each arranged to protect or expose certain parts. Compare Fig. 14 with Fig. 13 (see engraved supplements), both made from the same negative, the first uncontrolled, the second having been toned down above and at the sides so as to concentrate the attention on the light about the center, which, like a winding path, leads into the mysterious depths of the wood. Notice also that the rather ugly black boulder in the center of the print has been rolled away by no more forcible persuasion than the point of a lead-pencil and a scrap of tracing-paper.

The effect here is exaggerated, I know, for here

I have been compelled to make the reproduction from a lantern-slide copied from the original 18 x 24 print, which is no longer in my possession.

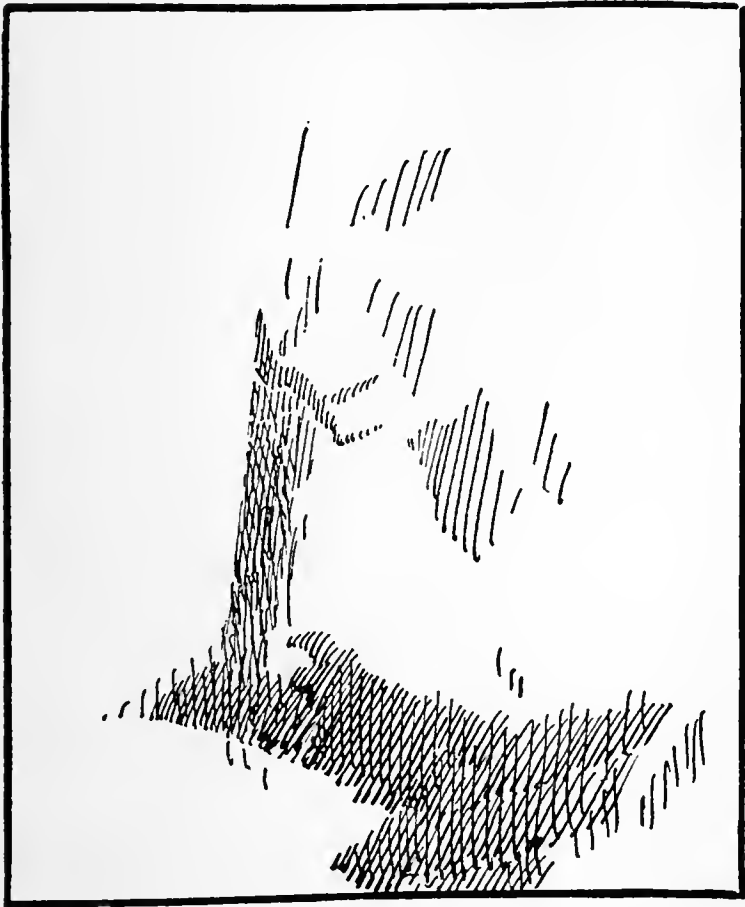


FIG. 12

A Fifth Illustration In Figs. 15 and 16 (see engraved supplements) is another pair of results, the harshness and halation of the one being got rid of in the second, and, as far as can be judged from so small a print, something more of the softness and delicacy of the beech-

wood in earliest summer secured. Before proceeding to briefly explain "why" I consider that some degree of control is necessary in almost every case, I should, I think, caution the young photographer who reads *THE PHOTO-MINIATURE* for practical guidance not to let his ambition outrun judgment and discretion.

A satisfactory means of control may give freedom from some of the mechanical restrictions of the photographic process, but the greater the freedom the greater the danger. The same means which makes it possible to alter tones and even to entirely remove undesirable objects for the improvement of the picture also renders it possible to make alterations which will prove wholly destructive even to the point of being ridiculous; and because the majority of photographers have not that intimate acquaintance with nature and have not gained an almost instinctive understanding which the artist acquires during the long period of his novitiate, there is grave danger of his stumbling and misusing his independence as soon as he oversteps the guide-ropes of the canons of the craft. But beyond what I should like to constitute a really solemn warning to never allow his power of control to produce something that is not well within the ordinary possibilities of nature, I must leave the student to his own conclusions.

It may perhaps be objected that the method of printing which has been suggested is primarily only applicable to silver-printing processes in which the image, being visible, can be watched and the shading down judged of when the plate or mask is removed from the paper and board; and I can

only answer by saying that I adopted the method described for platinotype printing from the first and have hardly ever had occasion to use it in silver printing. The partially visible image of the platinotype paper is guide enough, whilst, even were it not so, or if one is using the carbon process, it must at least be a more definite means of control than if we resort to mere guess-work.

The Influence of Imagination But why? if, as argued at the outset, the purpose of modifying the photograph of nature is to make that finer ideal which the imagination instinctively conjures up in the presence of any appealing scene, why insist upon the picture's not violating the apparently natural?

I do not know if, in the limited space now remaining to me, I shall succeed in making my reader fully understand the part imagination plays in the conception of a picture, even when that picture is produced by sketching from nature or by photography. There must be no confusion between a "fancy" picture and an imaginative one. The former is a pure invention, the latter is the mental impression which a real scene makes. For when we look at a fair landscape which for some reason appeals especially to us, we instinctively clothe it with a beauty which it does not possess in reality; our eyes dwell upon this or that spot, meanwhile we are but dimly conscious of the surroundings, the very suppressed presence of which is contributing in a negative way to the beauty of the object of our attention. Were we to turn away, the memory, the impression we should carry with us would be of this or that fea-

ture standing out from the rest, and possessing thereby greater importance, greater dignity. The impression of the sunshine, or of the awesome gloom, is greater than the real thing because it appealed to us, and in our imagination we lent it fragments of our past experience in the matter of light and gloom. Probably the tender, fragile undergrowth of flowers and plants was not more exquisite than elsewhere, or at another time, and yet we waxed enthusiastic over it, and remember not just the species or number, but the general beauty of that foreground. And if in the picture we aim at creating this finer view it must be done in strict conformity with what might have been, or we immediately betray ourselves, and must forego all hope of making others sympathize with or understand our feelings. The good imaginative work is always indistinguishable from a transcript from nature which it pretends to be; that is to say, on looking at it, it appears so possible, so reasonable, that none could say without positive knowledge that it is not true to fact. Naturalness in appearance is essential to an artistic result, but this must not be confounded with naturalness which is fidelity to fact.

**Possible
Objections** On the face of it, one might say that it is impossible to produce imaginative work by means of photography; but, in fact, the real difficulty lies in the absence of any imagination on the part of the photographer. If the photographer will not exercise his senses, think, or try to feel, how, had the fates so willed, the scene before him when analyzed might have been better composed, more

effective, softer in gradation, bolder in contrast, or what not, let him try by controlling his print to secure some of this more perfect beauty which he has been imagining, and he at once begins to idealize the real. Even in so simple a matter as toning down a strong light, or keeping back the printing of some too dark shadow, he is but representing things as he would wish they had been,—that is, as his imagination tells him they might have been.

Now, neither I nor any one else is able to tell another how to give his work this indefinable but essential character; but I can say to ninety-nine out of a hundred photographers whose works are included in “loan collections,” and are praised and medaled, that it is the absence of this quality which prevents their work from being more than mere “tasteful photography.”

Is the imaginative faculty a thing
Imagination that can be acquired? I think not.
a Gift?

We often hear it said that the artist is born, not made,—well, it is quite conceivable that the artistry, the technique and composition may be taught, but it is, probably, that associative and penetrative imagination which must be innate. The value and office of imagination is, as it seems to me, in this wise: the possessor of it, on witnessing a beautiful scene, takes in the whole beauty of it at once and sees a more beautiful, a more perfect landscape than is actually before him,—just as in the memory of a happy day each moment recalled is glorified by the associated memories of the other moments of that day. So the imagination takes in the whole scene at once,

and every item, when considered, appears more beautiful than it is because of the consciousness of the beauty of the whole. This is the man's impression, and hence it follows that the reproduction of the impression, done on the spot or from memory, will be finer than nature itself. And now note that this impression, this imaginative picture, owes nothing of its fairness to indefiniteness or indistinctness; the harmonious impression, due to imagination, comes from the fact that instantly as the viewpoint is changed, the whole contributes to that point, enhancing it, glorifying it; and yet we are conscious that each part of the whole is as clear and as capable of ennoblement as the particular point upon which for the nonce our attention rests. To represent by a blur that which we know to be as clear and distinct as the chief object of our attention, but that for the moment it is subordinated to it, seems to me to be but a poor means of conveying the truth. Hence, if permissible at any time, it seems to me that "fuzziness" as a method of representation should only be condoned when no other means are efficient; for there is to my mind a difference between seeing *indistinctness*, and *not* seeing distinctly, the former being but a ruse to represent the latter.

I have expressed a doubt as to whether imagination can be taught or acquired; but, on the other hand, I think it possible that many a photographer, earnestly desirous of doing better pictorial work, has never called his imagination into action, or has not known how to use it, whereas exercise and use will strengthen and improve it. If for the

Imagination
Latent

sake of these I attempt to give examples, they must of necessity be of a very elementary kind, and must seem very commonplace as compared with the higher line of thought which I hope the foregoing, although inadequately expressing it, may have suggested.

A Final Word What does the photographer do when looking for subjects? Does he not usually work on a more or less preconceived plan? He has acquired ideas of how a picture should be composed, and how the successful men focus and arrange; and, finding a subject, he seizes upon the external signs, and sets them down in the manner of some one else; little wonder that such a picture is not very impressive, and that "nice" is perhaps the highest praise that can be accorded to it. But without notice, and without preconsideration, a subject may for some unexplained reason make an immediate appeal; upon reflection, you are not able to explain precisely the reason, nor is it necessary, and yet it may occur to you that it is the light, the air, the reposefulness, which, because your imagination is attuned thereto, it exaggerates, and in your heart and mind you see a more perfect scene than is really there.

Such is my own experience, and hence it is that when I have the prosaic transcript at home I feel that to realize, in ever so small a degree, the impression which is still with me, something must be done during printing to emphasize the light, deepen the shadow, obliterate detail to produce simplification, or in a score of ways strive to produce that fairer prospect which my imagination

created. And then when the exercise of the faculty has strengthened it, and improved it, we shall find ourselves giving expression to it involuntarily, only conscious of trying to render our impression without asking if this be legitimate, or that permissible. I believe that with the imaginative man, from the moment he sees his subject, throughout all the mechanical performance necessary to secure it, right up to the production of the finished picture, he is unconsciously working toward the realization of his imagined image. Honestly working for accuracy, his copying of nature is an innocent pretence; he is copying his ideal, and reproducing his recollection or impression.

But remember, the means we adopt, and the manner in which, and the extent to which, we use them, are circumscribed by the fact that the really honest imaginative picture never exceeds the possibilities of existence; so soon as there is an appearance of unnaturalness, imagination has been exceeded, and caprice or fancy has stepped in where they are not required.

A. HORSLEY HINTON.

APPENDIX

The printing-frame or device invented by Mr. Nelson Cherrill, and referred to by Mr. Hinton as an aid to control in printing, was described at length before the London Camera Club a few weeks ago. We give here the only description of it which is as yet available, from a published report of the meeting:

After glancing at the subject of control from

the historical point of view, and indicating some of the arguments which might be used for and against the modifications of the strictly photographic image, Mr. Cherrill pointed out that there were two different kinds of control which could be made use of in photography—one being a fixed, and the other a variable or progressive control. The former had a final and fixed effect, which was no longer capable of variation, but in the case of the latter there was no fixed limit beyond which it was impossible to go, and it was of such a control that he would speak that evening.

To begin with, his invention depended on a perfect system of register, and the first problem was therefore to make a printing-frame which should admit of the negative and the print being separated, and the negative removed altogether from the frame, with perfect facility of putting them back again into position, in such a manner that there should be no suspicion of any want of perfect register. To secure perfect register there must be three points of contact, and three only. As a result of many experiments, he had found that the three points of contact were best obtained with only two pins. By means of the blackboard, Mr. Cherrill showed how he arrived at the three points of contact by making the pins of a certain considerable stoutness, and by using a V-shaped notch for two of the points of contact, and a straight-edge for the other. There was one very important practical outcome of this arrangement. If the pin on the straight-edge he moved a little to the right or left no difference would be made in the register. Hence it was evident that if sev-

eral registers were made with only moderate accuracy as to the distance the pins were from one another, all plates which fitted one would fit another.

The printing-frame in what he believed to be its final form was merely a frame of wood enclosing a glass plate. On one side of it were two rigid cylindric steel pins to form the register; at each end was a brass hook to hold the back, and between the pins was a simple spring clip. The back of the frame consisted of a rigid board, covered with soft felt or flannel on the inside, and over this was spread a layer of india-rubber sheeting.

How were the negative and the prepared paper to be fixed in the frame? The simplest form of support he had found was a frame made in very thin metal. If the negative was a film the best way to support it was on a sheet of celluloid. The best method of fixing the negative was to use strips of adhesive plaster. Alcock's porous plaster was the best material he knew of for this purpose. No damage was done in tearing off the plaster, even if it went right over the negative film.

As regarded the attachment of the printing-paper, the india-rubber sheeting on the back of the frame was brushed over with a little solution of india-rubber in benzole, which, being on a non-absorbent base, never dried, but always remained more or less tacky. By this means the printing-paper was, as it were, mounted on the back of the frame, but though mounted it came away in a moment when the print was finished, and the frame back, once prepared, lasted quite a long time in good condition.

In the first place, such a frame, he claimed,

gave a remarkable degree of control over the local definition of a picture. His plan to reduce excessive sharpness and painfully cut detail was to print for part of the time through a certain thickness of transparent medium, and for the remainder of the time in direct contact with the negative.

Turning to the case of values, Mr. Cherrill showed the use of this new printing-frame in lightening or darkening any portion of the print. In the case of lightening, the part to be reduced was simply blocked entirely out. This was done by means of a transparent mask made of thin celluloid, which could be painted over on the parts to be controlled. Such a mask was placed, in register, over the negative. The part to be operated upon was then painted boldly out with a non-actinic water-color paint. The position of the mask might be then reversed, and the printing commenced. The print would come out with a simple white patch for the part to be lightened. The frame might afterward be opened, the mask removed, and the printing continued with the negative only. The work might be varied at will, and changed to almost any extent during its progress. This was what he had called a "progressive control," and he showed several illustrations exhibiting the very large range of control which might be obtained in this way.

Mr. Cherrill further showed how by the employment of this frame it was possible to control a hard negative by using a transparent positive in conjunction with it, and also to harden such negatives as were too soft. The change in the

character of the image, which resulted from working with negative and positive together, was a very valuable softening, especially in portraiture. He explained at length the preparation of the masks, or carbon and other transparencies, of which he had been showing the results.

Finally, he introduced to the notice of the members another form of control—the simplification of what existed in the negative, by the expedient of making a positive in register with the negative, and printing, not the two together, but the one after the other, so that the one might, in a measure, destroy the work of the other. With this frame, too, the effect of “sunning down” was easy and certain, and no complication of outline caused the smallest difficulty. Other interesting points in connection with control printing were raised, and the lecturer expressed the hope that the system would not be without its effect in raising art photography to a still higher level.

Mr. A. Horsley Hinton, who occupied the chair, said that it was the characteristic of the majority of really effective inventions that the means employed were almost ridiculously simple. He alluded to his own drawing-board method of printing, which he had brought before the notice of the members some months ago, and which was to some extent in a line with Mr. Cherrill’s system. Proceeding, he pointed out some of the advantages and possibilities of the latter. It was certain, it was reliable, and, above all, one was able to get absolute contact by the pressure of the back board—the want of which in the drawing-board method was, he quite recognized, a defect.

NOTES AND COMMENT

The Ives Parallax Stereogram. Some remarkably interesting examples of Mr. Frederic E. Ives' new application of the principles of binocular vision are at hand. In external appearance these resemble ordinary "transparencies" to be hung in a window and viewed by transmitted light; that is, the backing is ground glass, and the image is protected by a covering piece of plain glass; only placed a slight distance away, so that there is a greater thickness noticeable when one takes it in the hands.

The picture is not clearly visible, however, except at just the right distance from the eyes, and when held exactly vertical on their level; then it leaps out of the frame, apparently, with a relief that is startling.

A marble bust of a girl wearing a flaring bonnet makes one feel the folds and edges that are seen projecting beyond the face on both front and back of the apparent picture-plane; one can't help the attempt to grasp the frill with the fingers, to see if it is not real, with the result that the fingers are seen through the frill. Another subject is the head and hand of a man aiming a pistol directly toward you—the barrel seems to stick out into one's face, like the grimmest of realities.

The production of these striking results is only

one of the many outcomes of Mr. Ives' life-long investigation into the phenomena of vision and the optics of photography, and their application to half-tone and three-color-process work.

As the name indicates, the basis of the effect produced is the peculiarity of human vision due to the separation, or "parallax," of the eyes. The right eye sees more of the right side of a near object, the left eye more of the left side; both eyes, used together, give accordingly a rounded, modeled image, due to the combination, by the optic and sensory organs, of the two distinct images, which are recorded as only one impression.

Without going into the detail of the apparatus, it may suffice to say that Mr. Ives uses, in making the negative, two small lenses, about two and one-half inches apart. These form overlapping images of an object a definite distance in front of them, at the focal plane, which is occupied by the sensitive plate. A vertical parallel-lined screen is, however, interposed at such a distance in front of the sensitive plate, and with the interval between the rulings so calculated that only alternate slices, so to speak, of the images formed by the one and the other lens, act on the plate.

From the plate a transparency is made, and this transparency is viewed through a counterpart of the ruled screen, the separation between the two being exactly the same as in the original operation. It results that when this is placed in front of the eyes, at a distance equal to the focal length of the lenses used, the right eye sees, through the transparent portions of the screen, the "slices" of the image formed by the corresponding lens, and

the left eye, those formed by the other lens. The interval between the ruled lines is so small—less than one-hundredth of an inch—that the effect on the visual organs is that of two overlapping continuous images, with the consequent roundness and relief due to parallax, just as in ordinary vision. It is, indeed, greater than in ordinary vision, because less focal adjustment is demanded, which explains the almost over-emphasis of the relief; the lens records more than the eye perceives, at any one instant.

The applications of Mr. Ives' invention are, in general, the same as those of stereoscopic photography, with these twofold advantages: no "stereoscope" or other apparatus is needed to show them, and they can be made of larger size—8 x 10, for instance.

We understand that arrangements are in contemplation by which photographers will be able to utilize the process, working in connection with the inventor.—C.



The users of Cooke lenses value them highly, and it is a question whether the advice "Just borrow a Cooke lens" which the makers proffer in their little brochure will be found so easy of realization. "Now that I have a wheelbarrow of my own, I'll neither borrow nor lend," is an old saying that may apply in these days as well as in Ben Franklin's time. At all events, a copy of this interesting booklet, just issued, may be had for the asking. The claims made for the lenses, as set forth by Mr. J. Ronald Taylor, and the re-

productions of high-class results attained by their use, may be pondered at leisure by every interested worker.—C.



Catatypy.—The function of hydrogen-dioxide in producing, by catalytic action, prints from negatives, by contact, without the action of light, is receiving much attention, especially in Germany. The sensitive compounds are usually the iron salts, though manganese and chromium bases are available. Paper pressed into contact with a negative which has been moistened with the hydrogen-dioxide, when drawn through a solution of ferrous oxide, for example, has the protoxide reduced to oxide, by action of the hydrogen compound. Hence a yellow image, consisting of iron oxide, results, which can be readily changed into other compounds; so that varying tones can be obtained, and of a very permanent character.—C.



From W. J. Spillman, of Washington, D. C., comes the “Capital Camera Card”—a clever form of outdoor exposure table, for readily ascertaining the timing required for various subjects, lightings, hours and seasons, based on the lens and plate-rapidities assumed.

A kind Providence has arranged on so liberal a scope the “safety limits” of exposure, provided one develops “according,” that we must perforce believe that many a negative succeeds in spite of all calculations. For those who would feel as if they had neglected a duty should they fail to “cipher out” each button-pressure, this tabula-

tion will be equally serviceable as, and much more convenient than many others. The price is 35 cts.

The Gurtner process, for producing transparencies in suggestion of natural colors, is brought forward in *Le Photogramme*, which states that excellent specimens have been shown recently.

A positive image printed in blue is superposed over another of the same subject, printed in orange-yellow. These prints are obtained from two different negatives, made, however, by the same exposure, on two specially prepared plates, with the film sides in contact. The plate nearer the lens is a slow one, dyed yellow. This plate is impressed with the blue rays, and serves as a color-screen for the second plate.

Development proceeds as usual. From the first plate, impressed by the blue rays, the orange-yellow print is made on chloride of silver, fixed without toning. From the second plate, the blue positive is made either by "blue print" methods or by staining.

It is claimed that these two positives in color, when properly superposed, will reproduce very closely all shades of color, outside the red. The process is patented and the materials will be soon put on the market.—C.

The element of chance is recognized as a powerful factor in the success of photographers' exposures; it has remained for the French journal *Photo-Revue* to enlist its aid in attracting readers. A column is devoted in each issue to a puz-

zle competition. An acrostic and a charade, involving some word "borrowed from the vocabulary of photography," are given for solution. All those who send the right answer to both problems then draw lots for the first prize—those who solve but one similarly draw for the second prize. Each contest calls out a hundred or more successful solutions.—C.



Mr. J. Ronald Taylor, at a recent meeting of the Photographic Society of Philadelphia, delivered an illustrated lecture on lens-making. He made an interesting comparison of the accuracy required in different trades: the bricklayer works to the eighth of an inch, the cabinetmaker to the hundredth, the machinist in thousandths, the watchmaker in ten-thousandths, while the photographic lens-maker works in hundred-thousandths every day.—C.



Rev. A. W. Cooke, Wakamatsu, Iwashiro, Japan, writes that he will gladly forward to any brother amateur samples of various grades of Japanese papers, to any correspondent in exchange for a ten-cent (U. S.) stamp. Some of the samples received by us would seem to be well adapted for home-sensitizing for plain silver, platinum and gum-bichromate printing.—C.



A dry-battery photometer has been proposed by Mr. E. T. Turner, of San Francisco. An incandescent light of known intensity acts on one side of a translucent screen; the light to be meas-

ured is thrown on the other side. If the standard light casts a shadow against the screen, it is the stronger; by diminishing the current the equalizing point is found, and by reference to a table the relative strength of the light is easily ascertained. This invention is the basis of the Photometer (San Francisco) now in the market.



Here is an experiment we recommend to our readers. Take a piece of white paper, of any kind; expose it to daylight for four or five minutes; then place this paper in close contact (in a printing-frame) with a piece of print-out paper, sensitized with chloride of silver, or bromide paper can be used, requiring development to show the image. This must be kept in obscurity for several hours. You will find that a print of the negative results.

If the same piece of white paper is kept for twenty-four hours in contact with a second piece, and this second piece for the same time in contact with the sensitized surface, an image will still appear, but fainter. How do you explain it?—C.



In reply to several correspondents and also as a matter of general interest, the United States agency for the photographic lenses and accessories manufactured by C. A. Steinheil & Sohn, of Munich, has been undertaken by the Fidelity International Agency, 621 Broadway, New York, to whom all communications concerning the Steinheil lenses should be addressed.

POSTSCRIPT TO NO. 54 THE PHOTO-MINIATURE

Under this heading will be published occasional postscripts to earlier numbers of The Photo-Miniature series, giving new or additional information.—[EDITOR]

The exposures given in the tables of THE PHOTO-MINIATURE No. 54 are for such brilliant sunshine as is usual in most sections of the United States. In places where the atmosphere is less arid, and the consequent sunshine is less intense, correspondingly greater exposures should be made. So also should they be increased in the neighborhood of large cities, where the atmosphere is more or less charged with foreign substances. Always when in doubt, the greater exposure should be given, yet it should be borne in mind that for really intense sunshine in a clear atmosphere, the table values had best be taken as they are given. Excepting in "snap-shots," the common vice in outdoor exposures is over-exposure. However, "snap-shots" as a rule are under-exposed.

Somewhat about lenses: It is not to be expected that the average outdoor photographer should attempt to master the science of optics, yet there are a few simple things which he should understand, and which generally he does not. To put these in words would take considerable space. To put them in simple formulæ would not only require little room, but make them really much easier to apply.

In the following, all lengths, sizes and distances are to be taken in inches:

Let,

A=the length of focus of any lens. When camera is focused upon an object, say, over 200 times the focus of the lens, then A=the distance of the optical center of the lens from the ground glass.

B=any camera extension; that is, any distance of the optical center of the lens from the ground glass. Hence,

B—A=the increased camera extension required for focusing on nearer objects.

C=the distance from the lens to the object.

D=the denominator of the fractions, $f/4$, $f/5.6$, $f/8$, etc.
That is, = 4, 5.6, 8, etc.

E=the size of object.

F=the size of image on the ground glass.

Then,

To find (A) the focus or the equivalent focus of any lens:

$$A = \frac{(B - A) \times E}{F}$$

With a long bellows, F can be made equal to E, and consequently A will equal B—A. That is, the focus will be exactly equal to the increased camera extension. With a short bellows, F should be made as near to E as the extension will allow, for the reason that where their difference is great, the slight errors in measurement and focusing will multiply themselves. In the above, a graduated rule makes a good object.

To find (B—A) the increased camera extension in order to be in focus on an object at any given distance:

$$B - A = \frac{C \times A}{C - A} - A$$

To find (C) the required distance from the lens to the object, in order to photograph the object to a given ratio or scale.

$$C = \frac{A \times E}{F} + A$$

To find (C) the required distance beyond which all objects will be in focus.

$$C = \frac{A \times A \times (100 + \frac{D}{A})}{D}$$

In practice it will be sufficiently near to omit the above quantity to D divided by A, thus making the above:

$$C = \frac{A \times A \times 100}{D}$$

To convert $f/$ stops to U. S. stops:

$$\text{U. S. stop} = \frac{D \times D}{16}$$

To convert U. S. stops to $f/$ stops:

$$D = 4 \times \text{the square root of the U. S. stop.}$$

To find the angle of view of a camera: Divide one-half of the longest side of the plate in use by the focus of the lens. The quotient matched in a table of natural tangents will give an angle of just one-half of the angle of view of the camera.

SPEED

The speeds of lenses vary as the squares of the highest $f/$ numbers in which they will give correct definition and work. Hence, a lens which will work correctly at $f/5.6$ will be just twice as speedy as one which can only work correctly at $f/8$.

If we are to have one lens for everything, we must be prepared for a good many compromises. A high-class lens can not work miracles in optics, but it is nevertheless much to be desired. Its chief advantage is that it gives good representation with large apertures, and this means a good deal. It not only by its light and speed gives us good negatives, which would be otherwise impossible in some

cases, but in all cases, by its larger apertures, it gives "atmosphere" to our photographs. A poor lens well stopped down will give good drawing, but the probability is that in the picture everything will seem to appear as in a vacuum.

Besides this the time required for the exposure will be such that it would be impossible to take any scene with moving objects. The proper use of stops should be understood. A good rule is to use the largest stop or aperture admissible with the required definition and depth of focus.

Another matter to be considered: If the lens has a relatively short focus, and at the same time covers the plate, it is of the wide-angle type. A wide-angle lens does not, as sometimes said, give a false perspective, but the objection is that the picture offends the eye by giving a greater angle of view than the eye can possibly see at one time. Its perspective is not false, but its great expanse of view is unnatural. It is sometimes said that the difficulty can be cured by holding the picture at a distance corresponding to the short focus. This, however, is not true, for at that position the eye can no more see the whole picture than it could see the whole scene from the position of the camera. The only imaginable cure would be to swap our narrow-angle eyes for wide-angle ones. A photograph of a tree or building, in order to satisfy an artist, must be taken back at a viewpoint demanded by the eye. If at such a position the image is too small on the plate, the remedy is a lens with a longer focus. To satisfy the eye, the focus should not be less than one and a quarter or one and a half times the longest side of the plate. Still for

other considerations, it is often necessary to use a short-focus or wide-angle lens.*

These notes will acquire a reflected worth and interest by some consideration of the able and luminous monograph of *THE PHOTO-MINIATURE* No. 56 by Mr. Driffield. We may well accept his definition of a perfect negative, as "one in which the opacities of its graduations are proportional to those parts of the original object which they represent." However, in our outdoor practice we will be wise not to insist too rigorously upon the terms of this ideal definition; otherwise, the large majority of our best negatives will fall below the line. The difficulty is this: It is common to see outdoor scenes with such contrast that plates with even the best latitudes can not hold without somewhat clogging up in the highest reflections, before the lowest ones can be sufficiently exposed. To say nothing of the impossibility of putting on the same plate with distinctness bright clouds and dark terrestrial objects, every one must be familiar with the difficulties of properly exposing on the same plate, for a light-colored object out in the open and a dark-colored one under shade. In the same scene the highest and lowest reflections are often so extreme as to overtax the elastic limits of even the best plates. So while the definition is ideal, yet for outdoor exposures it is probably unattainable in any critical sense, unless indeed

*There is absolutely nothing in the commonly expressed opinion that a long-focus lens will make near and distant objects appear nearer their proportionate sizes than will a short-focus one. If the two lenses are made to cover the same angle of view, the pictures will be identical, excepting in size.

The whole point is this: In order to please the eye, use a narrow angle of view. If within such an angle the picture is too small, then use a lens with a greater focal length.

we confine our work to gray days and monotonous scenes.

So, too, when Mr. Driffield proposes a "quantitative science" for exposures, we must refer it to the laboratory, where the light is known, or may be "quantitatively" measured. Plainly in the open field, there is no way of "quantitatively" measuring the well-nigh infinite reflections of the scene, which are to impress our plates. After all, the best we can do is to exercise our best judgments, based upon experience and the framework which science gives us. Let us be clear and honest in this thing: A perfect or ideal negative is an aim toward which we should all strive, but the most skilful only approximate it. Had we plates of sufficiently extreme latitudes, we might fill the bill. For a more specific understanding of this matter, let us analyze the

GENERAL THEORY OF LATITUDES

The following mathematical reasonings are quite simple and easily understood. Indeed, to many minds, the results drawn will be sufficiently obvious without the demonstrations. Those, however, who prefer may pass over the mathematics to the practical deductions.

In any outdoor scene, let the intensities of its several reflections and their corresponding proper exposures be represented as below:

Let,

- p = the greatest reflections of the scene.
- q = a medium reflection of the scene.
- r = the lowest reflection of the scene.
- s = the length of exposure due to p .
- t = the length of exposure due to q .
- u = the length of exposure due to r .

Then will,

$p \times s$ = the chemical work performed in the proper exposure of p.

$q \times t$ = the chemical work performed in the proper exposure of q.

$r \times u$ = the chemical work performed in the proper exposure of r.

Now by the commonly accepted doctrine, that the proper exposures are inversely proportional to the light intensities, we have,

$t : s :: p : q$. Whence $p \times s = q \times t$

Also $u : s :: p : r$. Whence $p \times s = r \times u$

That is, $p \times s$, $q \times t$ and $r \times u$ are all equal.

Consequently we are given the deduction that the chemical work performed in the proper exposure of any of the various reflections is the same.

If the chemical work $p \times s$ (which, as shown above, equals the chemical work for any other reflection) should be the extreme chemical endurance of the plate, then the plate would have no latitude, and with it we could obtain no proper negative. If the length of exposure given fell between s and u , we should have some one reflection in proper exposure, but the rest of the reflections, in their several degrees, would be either under-exposed or over-exposed, and almost all of them to such a degree as to render the negative of no value.

If, however, the plate could, without clogging, hold up the reflection q until the reflection r had had its proper exposure,—that is, if it could perform a chemical work of $p \times s \times \frac{u}{t}$,—then the plate would have a latitude represented by the ratio $\frac{u}{t}$. In this case, its latitude would enable us to properly expose all of the reflections from q to

r, inclusive; but it would be necessary to close the shutter precisely at u, thus giving a true negative from q to r, but over-exposed from q to p. So, also, if the plate's latitude was just sufficient to reach the reflections from q to p, they could be properly exposed, leaving the rest from q to r under-exposed. Thus we see that with a plate of such narrow limits of latitude, we should be forced to make choice of such reflections as we more particularly wanted, and leave the others to be under- or over-exposed, as the case might be.

If the plate had latitude sufficient to hold up without clogging the highest reflection p, until the lowest reflection r was properly exposed,—that is, if the plate could perform a chemical work of $p \times s \times \frac{u}{s}$,—then its latitude would be expressed by the ratio $\frac{u}{s}$, and, by closing the shutter precisely at u, we should have a perfect negative for every part of the whole scene. If, however, the shutter were closed before u, it is plain that the feebler reflections of the scene would be under-exposed, and, likewise, if the shutter were closed after u, the brightest reflections would be over-exposed. For a dull day and with a monotonous scene, the value of $\frac{u}{s}$ of the scene would probably fall below the latitude of a good brand of plates, but for a bright day and a scene of marked contrasts, the best brand of plates in the market has not sufficient elasticity or latitude to fill the bill. Hence with such a scene, the practical difficulties are apparent. Not only is the plate's latitude insufficient to fully cover the scene, but even the length of the exposure best fitted to the desirable features of the scene is in the nature of a guess.

Call it a scientific guess if you wish, but nevertheless it is a guess.

It may here be asked, that if all of this is true, why do we commonly find so many acceptable photographs? The answer may be found in the following.

Of the very best outdoor negatives, there is not one in a thousand which can strictly come under the definition, as "one in which the opacities of its graduations are proportional to those parts of the original." The reason that the photographs are acceptable is the fact that even a critical eye is satisfied with reasonable approximations. Besides this, if the chief point of interest in the picture is well delineated—well exposed—we are naturally disposed to be lenient with the rest. Indeed the stubborn artist would cavil at the terms of the definition itself. Everything shown with too minute a distinctness would offend him. His demand would be that the heart of the picture should be well portrayed, and the rest purposely treated only in a spirit of suggestion.

However, we should not be too much dominated by the artist in photography. The matters of painting and photography have not precisely the same ends. In photography we really want, in all parts, the best delineation compatible with what is termed atmosphere. The first practical step toward this want is to use only plates of the best latitudes. With such, if your exposure is exactly right (which would be a happy accident), then you will get the best possible graduations in your negative. If your exposure is only approximative (which is the rule), then you will get the

best graduations which your approximative exposure could possibly give.

In the preceding mathematical analysis, it was assumed that the lengths of the exposures are inversely proportional to the intensities of the reflections. This is not strictly true, or, rather, the law requires modification, if we wish to be more precise. If we suspend an apple sufficiently near a warm fire, it will become roasted after a certain length of time. But if we suspend the apple twice as far back, at which distance according to the law of radiation the heat would be one-fourth, the apple would not be roasted in four times the time in the first instance. Why is this? The reason is, the apple exerts a resistance against being roasted. That is, it has a constant of inertia. Let us call this inertia 1. Let us assume the heat units in the first instance to be 16. Then the heat units would be 4 in the second instance. Now, the effective heat units in the first instance would be $16 - 1 = 15$, and those in the second would be $4 - 1 = 3$. Hence we see that, upon these assumptions, it would require not 4 times, but 5 times as long to roast the apple in the second position as it would in the first. Now the sensitive plate has also an inertia. If under a certain light the proper exposure would be one second, under one-half of the light the corresponding exposure would be a little more than two seconds, because of the plate's constant of inertia. Also the latitude or bearing-up quality of the plate would be more than twice as long,—somewhat on the principle that a bridge can bear up as well under a heavy load moving slowly

as it can under a somewhat lighter one moving more rapidly. So, too, a slow plate, all other things equal, has a proportionately greater latitude than has a more rapid one. But in our practice it is probably needless to press these nice considerations to any precise results. In practice, it is quite sufficient for us to know that in a general way we should use as slow plates as our work will admit, and also that in subdued lights we may push latitudes further than in brighter ones.

If the general impression should be gathered, from all of the foregoing discussions, that science is of but little value in the practice of outdoor exposures, then it is an impression not intended. As far as it is really practicable, science is the proper foundation and framework, but above this foundation and framework an experienced judgment must do the rest. With all of these brought into play, while we may not be able to get ideal negatives, we will uniformly produce acceptable ones. Such a judgment will never allow us to attempt the impossible or even the untoward. It will suggest to us what to take and under what lights to take it, and science and the scientific judgment will tell us with reasonable approximation, how to take it.

Mr. Driffield, by demonstration, puts beyond question the fact that evils in exposure can not be cured in the development. In his clear words, development can not "be made to usurp the functions of exposure." It really seems strange that two chemical processes, so dissimilar, could be supposed to do each other's work. A carelessly

thinking man may conclude that because he can take two plates, expose them differently to the same scene, and then, by a modification of the development, produce two negatives which satisfy him, therefore over-exposure may be cured in the development. A better understanding of the matter would instruct him that either he was in both cases working within the latitude of the plates, or that his eye was too easily satisfied in the final results.

In any treatment of outdoor exposures, it may reasonably be expected that some consideration should be had to actinometers. Every photographer, amateur and professional alike, should possess such a meter, and acquaint himself not only with its reasonable uses, but also its limitations. Not only is an actinometer well-nigh indispensable in interiors, but there are conditions where it is of great use in outdoor work. However, for the general run of such work, a glance at a well-constructed table is both quicker, and, upon the whole, better for one's basis. The common practice of exposing an actinometer at or near the camera is frequently a fruitful source of error. We do not want to know the light at the camera, but the light at the scene, and often these have very diverse ratios. If one's camera is out in the open, and an actinometer be exposed near it in one's own shadow, the result will be quite different from the exposure made a few paces off under the spreading branches of a tree. Now we know that the exposure of the plate to the scene would be the same in both positions. With the sensitized paper, however, being colored

largely by the sky-areas presented, the difference might be twice or more in the one position than in the other. Besides, no two open positions are likely to have the same sky-area, and no two shade positions identical; and if we are to use our guessing faculties for the differences, then we at once abandon quantitative methods, and had best direct our judgments at the start to the light of the scene; for it is a canon not only of science, but of common sense, that no quantitative method is admissible which in its operation calls for an undue exercise of guessing. The best possible way to use an actinometer in an average scene is to place it in the lighter shadows of the scene, and facing the reflections which enlighten the scene. Do not place it in the deepest shadows, for by so doing it will give a factor so great as to "burn up" all other areas of the plate; and thus we see that the good old rule of "exposing for the shadows," like many other good rules, must be used with discretion. To expose the actinometer in the scene, however, is not always practicable. Frequently the scene is inaccessible, and, besides, we can not employ this method when we wish to use an evanescent light, such as the passage of a thin cloud over the sun's disk; for by the time we get the register of the meter the cloud probably will have passed. But, as before said, an actinometer is of great use in exceptional outdoor work. If one attempts work in a ravine or dell, densely shaded by boughs and vines, unless he is well practiced in such situations, he will be very apt to under-expose without its aid. So, too, in an expansive water view, overhung with white

clouds, it will be well for him to be guided by his meter, otherwise he will likely over-expose.

But for the general run of outdoor work, it must again be said that the quickest and best basis is a properly constructed table. It may here be added, however, that if one is ever to become a really accomplished photographer, he must for the great bulk of his work grow beyond his tables, or any other set rules of exposure. He must acquire, by practice, an instinctive perception of light values, and this he will almost surely do in time. While the instinctive judgment gotten by practice in any department of art is difficult to analyze, yet nevertheless it is usually reliable. We may, by the laws of probability, determine the precise value of a hand at cards, but we shall seldom find it to vary from the instantaneous judgment of a really skilful player.

Before leaving the subject of actinometers, it will be well to note the following: It sometimes happens that the actinic conditions of the sun's light are very puzzling to the inexperienced. On a warm spring day, when numerous light clouds are running, often the light seems to act with lightning rapidity. At other times the sun may seem to shine fairly well, and yet there appears an unaccountable obstruction to actinic light. In conditions like these, a useful way of employing an actinometer is as a sky-meter. It is generally known that the luminousness of the sky is an index to the light of an outdoor scene. Provide a tube whose length is, say, four times its diameter. A good form is of stove-pipe iron, 4 inches in diameter and 16 inches in length, open

at both ends. Have a movable cap fitted to one end. Paint the inside a dull black. Place the meter in this and expose direct to the sky—not to the sun. Note the time required to color the paper. Compare this with what you find to be the proper exposure of your plate for an average scene, with some given stop. You will thus obtain a comparative index for all conditions of atmosphere. Suppose, for instance, that it takes 10,000 times longer for the paper to color as for the plate to properly expose with stop $f/8$ or U. S. 4; then $\frac{1}{10000}$ of the sky-meter's time will give you your plate's time. If it takes the sky-meter 2 minutes, or 120 seconds, to color, then 120 divided by 10,000 will give about $\frac{1}{80}$ of a second for the plate, with stop $f/8$ or U. S. 4. If 10 minutes, or 600 seconds, then 600 divided by 10,000 will give $\frac{1}{8}$ second, and so on with any other factor than 10,000. Of course it will not be necessary for one to lug such a device around with him. It will usually only be needed to test the sky when he starts out, and afterward modify his table accordingly. If the tube were made shorter, the paper would color quicker, but it will be well to make it in the above proportions, so that, at all times and situations, only sky reflections will reach the base.

GASTON M. ALVES.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

MAY, 1904

Number 62

Vacation Photography

There are few pleasures in life comparable to the annual vacation. To lay aside the familiar duties of every day; to leave behind us the little world of the daily round, with its sobering associations and dull monotony, and to go out into the great world of changing scenes, strange people and unfamiliar tongues, journeying lightly (as transients and spectators only) along ways and in places hitherto existing only in hearsay and imagination; or to spend a few weeks out-of-doors, with woodland and stream or sea and sky for company—these are pleasures indeed. And, later, there is the peculiar pleasure of the return to one's own place and one's own people, refreshed by broadening experiences, enriched with new associations and delightful memories.

Photography can add immeasurably to these holidays if we but know how to utilize its wonderful possibilities. To the mere excursion it adds the keener pleasures of the chase. If we take a camera there is more than simple seeing in our journeying. Everything has a twofold interest.

Then to the after-memories of the holiday, photography adds a wealth of detail and incident otherwise unremembered, focusing the vague outlines of things more clearly than recollection alone can trace them. With our travel photographs, the inspiring days among the lakes and mountains, or along the shore at home and abroad, may be recalled and lived again with all the illusion of life, as we describe them to the less fortunate stay-at-homes. There is no need, however, to enlarge upon these things here; the advantages of photography *en tour* are so fully appreciated that few of us would dream of going on a holiday without the camera.

And yet, despite the simplicity of modern photography and our familiarity with its processes, our holiday photographs are rarely satisfactory. Not that we expect them to rival those sold in the shops everywhere, but somehow they prick our self-conceit, falling so far short of what we thought we could do. There are many excuses, of course, for our failures. But the real reason is not far to seek, although seldom perceived in time to be of practical use. Photography somewhere-else is different from photography at home. In this, which we forget or fail to appreciate, lies the solution of most of our holiday failures and disappointments. The experience of the average amateur does not extend far beyond the narrow confines of his every-day surroundings. As a result, his grasp of the problems of negative-making is local and incomplete, depending all too largely on conditions well understood by oft-repeated contact. On vaca-

The Rift in
the Lute

tion we encounter new conditions which differ from those to which we are accustomed, and our preconceived notions do not fit in with the altered circumstances. There is need at every turn for modifications of our usual practice, and a resourcefulness which can come only from a wider knowledge than we possess, or a careful preparation for the particular vacation. Lacking these indispensable aids the traveler guesses—and too often fails to guess aright. Hence the photographic results of our holidays are disappointing, and we are dismayed to find so many failures where past experience (at home) had led us to expect at least a reasonable measure of success.

**The Scope of
this Book** Here we have the scope and purpose of this number of **THE PHOTO-MINIATURE**: to set forth plainly what the amateur should know about photography on vacation; to discuss some of the difficulties likely to arise when working away from home; and to make the traveler's success less uncertain by providing against the interference of local and constantly changing conditions. It is a big field to cover in a few pages. Vacations differ so widely and every vacation has its own problems. Evidently, too, the complexity of the subject will compel the discussion of points which may seem trivial to the individual reader here and there. But this is unavoidable if the little book is to be generally helpful. Unto every man, therefore, according to his need. Let no reader suppose that his own little holiday demands the digestion and absorption of everything written at length herein. Heaven forbid! With which word of caution I

will begin at the beginning, taking up first the vitally important work of preparation so generally neglected; then details of equipment and manipulation; and finally, conditions peculiar to typical holiday districts at home and abroad.

**Preparation:
the Key to
Success** The biggest and plainest fact about vacation photography is that its success depends, first and last, on the preparatory work done at home before the holiday itself begins. It will not do to hurriedly pack a camera and plates or films with the rest of the holiday baggage and trust to luck that this will serve our need. More than half of the amateur's vacation failures are due to his unpreparedness—lack of information, lack of equipment. It is true that the photographic work done on vacation is chiefly negative-making, with which we are all more or less familiar. But it is negative-making *plus* local conditions of which we know little or nothing. And there's the rub! These local conditions are the disturbing factors which must be known and provided for beforehand. This simply means careful preparation—the old-fashioned ounce of prevention which is still worth a pound or two of cure.

**For the Short
Holiday** Let us take this preparation leisurely. There is no need to make it burdensome. It simply means an intelligent survey of the holiday from the purely photographic point of view, after all the usual planning is over and done. The amount of detail and interest we put into it will depend upon the scope and locality of the vacation and one's personal ideas about thoroughness. If the holiday is to be short

and spent at a near-by resort, we may content ourselves with a glance over the subjects characteristic of the locality, and the adaptation of one's equipment to the simple requirements of the case. Naturally, the more careful the preparation, so much the more certain will be our success. For instance, if we are going to spend a week at the seashore, a little forethought will tell us to make sure of the actual speeds of our exposure shutter, so that the surf pictures made at $\frac{1}{100}$ second, according to the speeds marked on the shutter, will not be failures because the shutter gave only $\frac{1}{40}$ second instead of $\frac{1}{100}$ second. Similarly, a little thinking beforehand will urge the practical wisdom of backed or nonhalation plates and a color-screen for our mountain trip, where our views will often combine an intensely bright sky with dense masses of woodland and hazy distances. Forethought, too, will remind us that the near-by resort is tantalizingly distant when supplies from town are wanted in a hurry. Wherefore, even for the short vacation, the wise man will make due preparation and, by his equipment and information, avoid unnecessary trouble and disappointment.

For the Long Vacation When the holiday is to cover a few weeks in a distant locality, with frequent changes of base, greater care should be given to the preparation. Here, distance (the journey), latitude, topography, climatic conditions, possible variety of subjects and the like should be briefly reviewed as directly influencing the equipment, work and results of the holiday. Where the locality offers subjects of special interest, pictorial or historical, or where

permission is required for photographic work, as is often the case with show places at home or abroad, these special conditions should be noted and, as far as may be, provided for before leaving home. In the case of a trip abroad, transportation, customs, regulations, permits and forbidden zones (military reservations, etc.) should not be overlooked. Here preparation not only clears away the uncertainty of success, but will surely save much trouble and annoyance on the trip itself.

How shall we obtain this detailed information? In part, from the **Sources of Information** maps, guide-books, gazetteers and travel booklets, such as one naturally accumulates in planning a vacation. In a smaller but more important measure, from the reports of others, who have visited the district in which we are for the moment interested. For America, the topographic series of maps of localities (scale, 1 and 2 inches to the mile), published at 5 cents each by the U. S. Geological Survey, Washington, D. C., offer much useful information. These may be supplemented by cyclist road-maps, state and county maps, such as the Rand, McNally series; and the excursion folders, issued by railroad, steamboat and trolley companies. Among these latter Nos. 3, 5, 6, 7, 8, 10, 14, 31, 34 and 35 of the *Four Track Series*, published by the New York Central Railroad, are fair examples of the innumerable booklets issued by American and Canadian railroads. The new edition of Baedeker's *United States* (1904), also, deserves mention as including more local information for American travelers than former editions.

For Great Britain, Bartholomew's "Half-inch to the Mile" maps (Bartholomew & Company, Geographical Institute, Edinburgh) are excellent, showing altitudes, streams, antiquities, roads, footpaths and hotels in addition to the usual features. Sections measuring 20 x 30 inches cost 1/ (25 cents). The well-known English Ordnance Survey Maps, 1 inch to the mile, are obtainable from E. Stanford, 14 Long Acre, London, W. C., and this dealer issues an interesting catalogue of maps and guides for continental Europe. Philip & Son, 32 Fleet street, London, list an unusually complete series of European and other tourist maps. The British railway companies issue many handbooks to holiday districts, some of which can be obtained from the companies' offices in New York. Among British guide-books, Dent's *County Guides* and *Temple Topographies* should be mentioned. For continental Europe, Murray's, Baedeker's and Grant Allen's guide-books are, of course, indispensable.

The work of describing particular localities from a photographic point of view has, unfortunately, been almost wholly neglected by our American journals. In Europe, on the other hand, this good work has been systematically followed by several photographic papers. Thus we can readily obtain detailed information concerning the photographic possibilities and facilities of almost every nook and corner of Great Britain and Continental Europe, while on this side of the Atlantic the individual tourist must find these things out by personal experience. Among special sources of

Photographic
Gazetteers

this kind of information for travelers in Europe may be mentioned: the *Photographers' Gazetteer*, a valuable feature of the *News Year Book* since 1897; the *Tourist Column* of the *Amateur Photographer* (London) since 1887; the *Enquiry Bureau* of the *Photographic News* for the past few years; and the invaluable *Directory of 3,000 Dark-rooms and Dealers*, published yearly in the June issue of *The Photogram* (London). The *Red Book* of the English Photographic Societies' Affiliation, and the *Blue Book* issued by the Federation of Scottish Societies also offer much information about special localities and permits to photograph.

A Note-Book The first step in preparation for the holiday should be the making of a note-book of photographic data. There may be a little trouble involved in this, but it will abundantly repay the time spent upon it. Get a blank book, in size convenient for the coat pocket, with flexible leather binding and a pocket in each cover for maps, etc. On the left-hand pages, arranged in order so as to follow the itinerary of the holiday, enter all the special information obtainable concerning points of interest, subjects, distances, photographic facilities etc., likely to be of practical help during the trip. The right-hand pages should be left blank, ruled with spaces for plate or film numbers and particulars of exposure. On the first two pages briefly list the apparatus and conveniences required on the trip. This list will be added to or revised as the mental survey of the holiday proceeds. The items should be individ-

ually checked as they are gathered together for packing. This note-book will prove a ready guide to photographic work at any stage of the journey, and will also provide an exposure record—of which feature more later.

As the preparation of such a note-book may offer difficulties to some readers, an illustration of its make-up will be useful. Let us suppose that, as part of a week in England, we intend to spend a day or two at Canterbury, a delightful old town with one of the finest cathedrals in England. The guide-books tell us that Canterbury is sixty miles from London *via* London, Chatham and Dover Railroad. As we can spend only one day there, we must leave London the night previous and rest at Canterbury, in order to have the early hours of the day following. A little reading in Dent's *Cathedrals of Great Britain* (London, 1902) gives us an interesting account of the exterior and interior of the Cathedral, the best views, etc., and from pages 262–263 of the *News Year Book*, 1903, we obtain helpful photographic information, as follows:

CANTERBURY:

Dark-rooms:—E. Bing and Son, 14 St. George's street; Lauder and Smith, The Medical Hall; Pollard & Son, 53 St. George's street; Walker and Harris, Sun street (opposite Christ Church gate).

Cathedral open for inspection on week-days between 9 A. M. and 7 P. M., except during service. Services at 10 A. M. and 3 P. M. Permits for the Cathedral from the Dean or Canon in residence or head Verger. Fee, 2s. 6d. per day. St. John's Hospital, apparently none required. St. Martin's and other churches, from the respective Vicars. At St. Martin's a fee of 1s. is payable.

CANTERBURY (continued).

7 to 8 A.M.—Cathedral (full length from Green Court—best in spring). The Prior's Gateway and Cathedral Tower. The Baptistry. The Bell Harry Tower from near the Reculver Church Columns. The Cathedral Tower from the northeast, including projecting bay of house, with four carved bracket figures. The east and south sides of Cathedral, taken from the east.—View of River Stour, with church tower, from Friars' Bridge.

7 to 10 A.M.—Mercery Lane with the western towers, from High street. The building at the corner of the lane was the Chequers of the Hope (Chaucer).—Butchery Lane.—View of River Stour, including part of Weavers' Arms, from the East Bridge.—The Blackfriars, now used as a Unitarian chapel.

8 A.M.—Old house corner of Palace street and King street.—The Greyfriars, in private grounds, but the reverse side is best about 3 P.M.

10 A.M. to 2 P.M.—Christ Church Gateway (1517). Notice the carved doors of same.—The Roper Gateway, St. Dunstan's street—the oldest brick structure in Canterbury, now the entrance to a brewery.

11 A.M.—A good view of the Cathedral Tower can be obtained from St. Margaret's street, a little north of Slatter's Hotel.—Column with cap, illustrating the humour of animals, in St. Gabriel's Chapel in the crypt.—St. John's Chapel in crypt.

11.30 A.M.—Archbishop Morton's monument in the crypt.—The Somerset monument in the Warrior's Chapel.—South Choir Aisle, including the "Pilgrim's Steps," Black Prince's tomb, and St. Anselm's Chapel.

11 A.M. to 3 P.M.—Archbishop Chicheley's monument.—The Norman Staircase.—The Black Prince's monument, etc.—The Choir.

12 NOON to 3 P.M.—Chapel of the Martyrdom and the monument of Archbishop Warham. The adjoining monument to Archbishop Peckham has an effigy in bog oak.—The south porch—notice the ceiling.—The pulpit and the font in the nave.—Archbishop Tait's monument.—Becket's Chair.

2 to 2.30 P.M.—The Choir Screen. North Choir aisle.—Doorway in the cloisters and exterior of cloisters, and monks' lavatory.—The chapter-house.

3 P.M.—The Dark Entry (Ingoldsby Legend). A telephoto view of Cathedral, with trees, etc., from near

the railway crossing, reached by Whitehall Road. Another telephoto view can be obtained from the foot-path leading to Harbledown.

3.30 P. M.—Arch of Christ Church Gate (W. A.), including the towers.—The Marlowe Monument.—St. Augustine's Gateway.—The West Gate, including Holy Cross Church, or the Falstaff Hotel.

4.30 P. M.—Entrance St. John's Hospital, looking outward.

The Canterbury Crypt is the finest in the country, and affords material for many exposures. The cups of many of the columns are finely carved.—The Martyrs' Monument, Martyrs' Field, is a very recent erection.—St. Martin's Church contains a Saxon Font, and one or two other items of interest.—St. Dunstan's Church contains the Roper monument.—Holy Cross Church has six Miserere seats.

EQUIPMENT :

From these notes we add to our equipment list, if not already there, as follows:

Reliable camera level.

Dependable tripod.

Exposure meter for interiors.

Backed or nonhalation plates.

Wide-angle lens.

Telephoto attachment.

Another Example For a second example, let us plot out a few days' holiday in the Catskill Mountains. New York is the

point of departure and Haines' Falls ($4\frac{1}{2}$ hours distant) our holiday center. The journey, by Albany Day Line Steamer, carries us through the Highlands of the Hudson, passing Tappan and Stony Point, the scene of Major Andre's flight and execution, West Point and its famous Military Academy, and Newburg, the headquarters of Washington and the last Continental Army. At Catskill Landing we leave the boat and proceed to Haines Corners *via* Otis and Tannersville railroad, this part of the journey including the Otis

Incline, where the train ascends 2,000 feet in ten minutes. It is July. Our difficulties will include halation, an intensely bright light on fair days, dense inactinic masses of green on dull days, distances veiled in mist, waterfalls, wood interiors and, on the journey, sunlit stretches of water. The district abounds with pictorial opportunities, and for incidentals, there are golf-links, deer-park and bits of village life. An interview with a photographic friend who has visited the locality gives us more local detail, so we proceed to fill a few left-hand pages of the note-book about as follows:

EQUIPMENT :

- Ordinary hand-camera outfit.
- Exposure shutter tested for actual speeds.
- Light yellow screen.
- Pinhole attachment for occasional use.
- Backed or nonhalation ortho plates, or films.
- Tripod ; focusing cloth ; extra ground glass.
- Changing bag if plates or cut films are taken.

JOURNEY :

Leave New York at 8 A. M. Sun crosses the Hudson at an angle of 45° from behind us, lighting West Shore points favorably until 11 A. M. Work from lower (main) deck of boat, exposures to be made as we approach subjects, to avoid photographing against the sun. Ortho nonhalation plates desirable to counteract glare of light on water and hazy distances. Use color-screen if exposures are made from tripod at landing points. General views of Highlands should be secured between Stony Point and Cornwall, separate exposures at Stony Point, Iona and West Point, if desirable. An extra plate may be given to the Otis Incline Railway, if conditions are favorable.

HAINES CORNERS :

Dealer and dark-room opposite railway depot ; another on Main street, Tannersville, twelve minutes by rail. Excursions: (1) Haines Falls (200 feet) at entrance to Sunset Park ; best view from foot of Falls, 10 to 12 A. M. Fee of 25 cents to bridge attendant will increase flow of water over Falls, if desired. View of Clove

looking north from bridge above Falls, about 1 p. m. Ortho plate and color-screen, with tripod. Woodland paths in and about Santa Cruz and Sunset Parks offer good material for pinhole work. (2) Main road through village to Laurel House gives fine panoramic views early morning only, or after 3 p. m. for sky effects: color-screen essential. Lane turning to right from main road leading to Laurel House has good pictorial opportunities. Returning to village along narrow-gauge railway (on foot) gives good view of Kaaterskill Falls, near Laurel House; best time, 3 p. m. (3) Wood roads from Laurel House to Mountain House and on to Kaaterskill House, offer material for six to twelve exposures, with abundant choice of subjects, between 10 a. m. and 2 p. m. Pinhole attachment, with tripod, useful here. (4) Deer-park on private estate near Highview House, open to public on certain days each week, and golf-links near Sunset Park. (5) Road to Tannersville from Church in village leads through a pine grove worthy of a visit; tripod essential, as light is slow. In the village itself the arrival of the Rip Van Winkle express, daily 5 p. m., is worth a plate, and the stream which runs near the railway depot will repay a morning walk.

So much for these left-hand pages.

Note-Book and Exposures To connect our blank right-hand pages with practical work, number the spaces consecutively. Now affix a small gummed label to each slide of your plate-holders, so that each holder will have two blank labels on which erasable numbers can be written with pencil. When an exposure is made, enter the particulars in one of the numbered spaces in the note-book, and put this space number on the label of the slide containing the exposed plate. When changing plates (reloading), transfer the number from each slide label to the plate itself (in pencil), and erase the number on the label. Thus each exposed plate will bear a pencil number corresponding to a numbered space in the note-book

where particulars of the exposure are recorded. This handy method of keeping track of exposures during a holiday is advised by D. G. Archibald, *American Annual*, 1903. Roll films and Film Pack exposures cannot be disposed of in this way, as we cannot number each individual exposure. The spools or Packs, however, may be plainly marked alphabetically,—A, B, C, D, etc., and the note-book spaces numbered in twelves to correspond, thus: Spool A, spaces numbered A1 to A12; Spool B, spaces numbered B1 to B12. This will tell at a glance what subjects are included in this or that spool, and give us choice in development if desirable.

Reading Whether the vacation be short or long, it is folly to leave home without giving oneself the advantage of a little course of reading covering the work likely to be encountered. This will provide specific information useful in emergencies, and may save us from failure. Much of this information is, of course, contained herein, but the bibliography at the end of the monograph may be consulted with practical benefit.

Equipment The final stage of the preparation, and one which has much to do with success, brings us to the consideration of the equipment for holiday photography. This includes not only getting together the necessary apparatus and supplies likely to be needed, but more particularly the overhauling of our apparatus to make sure that it will not fail us at a critical moment and render our work abortive. As I have already pointed out, the equipment for any particular vacation will be indicated in the mental survey of

that holiday. Much of what follows must, therefore, be written from a general viewpoint, the reader being left to take such items as apply in his case, cutting out all unnecessary details.

It is often urged, as against any special provision in apparatus and supplies for the holiday, that the average man has to content himself with such apparatus as he already possesses, and is rarely able to afford the luxury of a special outfit for vacation purposes. There is common sense in this. Unless photography is to serve a deliberate purpose during the holiday, special expense is unjustifiable and unnecessary. The point of chief importance is to give sufficient forethought to one's requirements to assure successful work away from the usual base of supplies. With this knowledge, the adaptation of existing apparatus to holiday purposes becomes a comparatively simple matter. Thus, the architect whose holiday is to be spent in Europe may find that a telephoto attachment here or a pinhole attachment there will offer definite advantages over the medium-angle lens attached to his camera. Forethought will provide these before leaving home and a little course of reading in *THE PHOTO-MINIATURE* Nos. 26 and 27 will enable him to get much more satisfaction from his holiday work than would be possible without this preparation. A score of similar examples might be given, but these things are sufficiently obvious.

Apart from special requirements,
The Ideal the ideal outfit for vacation photog-
Outfit raphy may be briefly stated as follows: A convertible lens, giving choice of three

foci and a wide-angle lens for very occasional subjects; a camera combining portability and bellows extension sufficient for the four lenses mentioned, with vertical and lateral front movements, double swings, finder and focusing scale accurately adjusted to the lens to be used for general work; a shutter certain in its operation and having its actual speeds marked on the dial; backed plates or films; and a strong, reliable tripod. With these, and a convenient changing bag if plates are taken, the traveler will be well equipped.

For special work, as indicated in a preliminary survey of the trip, the following may be mentioned: Ortho nonhalation plates or films, color-screens, a good level, telephoto and pinhole attachments, an exposure meter for difficult interiors, and a focal plane shutter for high speed work.

The reader who will check the items in these two paragraphs by the apparatus he has will see at once wherein his equipment approaches or falls short of what may fairly be considered an ideal outfit. It should not be supposed, however, that good work depends upon the possession of such an outfit. The man who takes simply a reliable magazine camera, such as can be had for \$5 (a guinea), as well as the man who depends wholly on a Zeiss-Palmos or a Goerz-Anschutz, can get lots of fun and good negatives to boot provided that he knows the capabilities of his instrument.

Overhauling Many vacation troubles can be avoided by a careful overhauling of all the apparatus, new or old, to be used on the trip. This can be done in odd moments, and will

well repay all the time and trouble it involves. It should cover particularly the camera and its movements, the lens, finder and focusing-scale, shutter and plate-holders.

New Apparatus Do not leave home with a new outfit which has not been searchingly tested by actual work outdoors in sunlight. Trust nothing to chance. Let me illustrate. Some time ago I purchased a hand-camera outfit for plates $3\frac{1}{4} \times 4\frac{1}{4}$, supposed to represent the best in the market, supplied by a maker of the highest repute. It was delivered the night before I left home for a holiday, and its beauty was warmly admired. In filling the six plate-holders I lost two plates—broken after the holders were filled by the excessive pressure of springs strong enough for rat-traps. Later, when the opportunity came to make exposures, I lost six of my ten remaining plates by a defect in the construction of the holders—the plates dropped an eighth of an inch inside the holders when placed vertically in the camera, the spring pressure forced them out of the rebate, and the insertion of the slide after exposure completely forced each of the six plates into the body of the camera. Further, the rubber tubing attached to the shutter proved defective, necessitating extraordinary pressure at the bulb to ensure the proper action of the shutter at each exposure. This, to be sure, was an unusual streak of misfortune, but it taught me that even the best and newest apparatus requires overhauling just as much as the old outfit of which one is naturally suspicious. The following hints, therefore, apply to both new and old apparatus.

Is the Camera Light-proof? In the case of folding or bellows cameras this can be determined very simply. Take the camera and a stout focusing cloth outdoors in sunlight. Remove the focusing screen, cap the lens or set the shutter, and extend the bellows to its full capacity. Hold the camera well up to the light with your head at the open end, carefully excluding all light from the interior of the instrument by means of the focusing cloth. Turn the camera about so that the sunlight will reach every possible weak point and operate the sliding front to its full capacity. After a few minutes the eyes will become accustomed to the darkness and any minute holes or breaks or bad joints in the bellows, or at the ends where the bellows is attached to frontboard or body, will be seen. Defects in the bellows can be mended with pieces of black court-plaster, or thin black rubber attached with the rubber solution used by cyclists for repairs, or any thin opaque fabric and fish-glue. Cracks or holes in woodwork should be stopped with sealing-wax, yellow soap, or thin glue and fine sawdust, or plaster of Paris and any dark coloring matter such as burnt umber. Magazine or box cameras are not so easily tested. *The Photogram* suggests the use of an electric bulb led into the camera through the lens mount (lenses removed), the camera being placed in an absolutely dark room. This method will reveal any defects in the box and locate them at the same time. If the lens-board or the joint where the back is inserted leaks light by loose fitting, this can be remedied by lining the joints with thin velvet attached with fish-glue.

Shutters These sometimes admit light when set or closed. This, if suspected, can be tested by covering one-half of a plate with black or opaque material and making all the motions usual to exposure except that the shutter should remain set. If, on development, the unprotected portion of the plate shows veil or fog, examine the shutter fittings and front-board for the leakage. In overhauling the shutter, opportunity should be taken to test its actual working speeds and so learn how far you may depend on the speeds marked on the dial. There are several methods of testing shutters by home-made devices, but the simplest, surest and most economical way in the end is to invest in the Wynne Shutter Tester and expose a few plates according to the instructions accompanying the instrument.

Plate-holders are tested for leakage by inserting plates in total darkness and leaving the charged holders (closed) exposed to ordinary daylight for ten minutes or more. Turn them about so that the light has every chance to penetrate possible weak points at the grooves, at the top strip, and at the light-trap where the slides are inserted and withdrawn. Defective holders are best remedied by the purchase of new ones. Repairing a broken or damaged plate-holder is a ticklish job for the amateur carpenter, and patched holders offer many risks when working out-of-doors in sunlight. A supply of felt bags with generous flaps, one for each plate-holder carried, is a very desirable addition to the vacation outfit. These protect the loaded holders from damage and undue exposure to light during the daily trips.

Finders All view-finders, except the full-size finders peculiar to cameras of the reflex and the twin-lens type, are compromised at best. A common fault in the finders supplied with popular-priced hand-cameras is that they show a larger amount of the subject than is included within the limits of the plate used. Accuracy in this detail is sometimes essential and always desirable. To verify the limits of the finder, proceed as follows: Remove the back of the camera or other plate-holding device, and insert a piece of ground glass in the position occupied by the plate or film during exposure. If the camera has a focusing screen, this operation is, of course, not necessary. Now set the camera on a table or tripod at an open window showing prominent distant objects. Arrange the camera so that a distant object, e. g., a tall chimney, just falls on the edge of the ground glass with the focusing scale set at Distance. Now compare the finder and focusing screen-images and see whether the chimney or other object corresponds with the margin of the finder. Repeat this operation with the distant object at the other side of the view. Turn the camera on its side and test the other two margins of the finder in the same way. If the finder shows more of the view than is given on the ground glass, take strips of black gummed paper, or a brush charged with black paint, and cover the glass screen of the finder until the two views exactly coincide. This will correct the finder for distant views. Now set the focusing scale for the nearest distance marked and, using a candle-flame in a darkened room as the object, arrange

the camera so that the image of the flame falls on the margin of the temporary focusing screen as before. It will be noticed that increasing the distance between lens and screen in focusing the near object has reduced the view-angle on the finder. When the flame is at the margin of the focusing screen it will fall well within the limits of the finder. Mark the reduced picture angle with a point of black paint, and proceed to correct all four sides of the finder in the same way. These black points will then serve to mark the limits of the finder when near objects are photographed.

Focusing Scale The accuracy of the focusing scale attached to the hand-camera, i. e., its adjustment to the lens supplied with the camera, can be roughly tested by setting the camera up at a given point and measuring the distances off in feet as marked on the scale, with a tape-measure and a piece of chalk. Thus, if the scale reads 6, 8, 10, 15, 25, 50, 100, mark these distances in feet as they are measured. A garden walk or bit of quiet roadway will serve for this. Now open the lens to its full aperture, set the scale indicator at the figure 6 on the scale, place some prominent object or a friend at the 6-feet mark and, with the focusing screen on the camera or a temporary screen rigged up as mentioned in the preceding paragraph, see whether the object at the 6-feet mark is in sharp focus on the screen. Repeat this operation for each mark on the focusing scale, moving the object to the required distance for each test. If the tests give sharply defined images for each mark, the scale is correct for use with the lens ; if it is not correct, return

the camera and lens to the maker for adjustment or a new scale.

As the correct estimation of distances is not always an easy matter, it is important to know what latitude of error we have when setting the indicator at any mark on the scale. In other words, when we set the scale indicator at any given point, what are the nearest and farthest distances within which the subject will be fairly in focus. The range within these distances is the depth of focal field, and varies with the focal length of lens and the stop used. A scale of distances for a hand-camera with a lens of $5\frac{1}{2}$ inches focus is appended: [F. E. Mills, *Photo News*.]

FOR LENS $5\frac{1}{2}$ IN. FOCUS

F/8			F/11			F/16			F/32		
N	F	D	N	F	D	N	F	D	N	F	D
5	6	7	5	6	8	5	6	$9\frac{1}{2}$	4	6	12
$6\frac{1}{2}$	8	10	6	8	12	$5\frac{1}{2}$	8	16	5	8	6
8	10	14	7	10	17	6	10	27	$5\frac{1}{2}$	10	79
9	12	19	8	12	25	7	12	50	6	12	Inf.
$10\frac{1}{2}$	15	30	9	15	43	8	15	300			
12	20	55	11	20	160	8	16	Inf.			
14	25	121	12	23	Inf.						
15	30	625									
16	32	Inf.									

N—nearest object in focus. F—point focused on.
D—distant object.

A similar table, worked out for a camera with lens of 5 inches focus, follows: [F. C. Lambert, *Practical Photographer*.]

FOR LENS 5 IN. FOCUS

F/6.5			F/8			F/11			F/16			F/22		
N	F	D	N	F	D	N	F	D	N	F	D	N	F	D
						4	6	8	4	6	11	3	5	11
			6	8	11	6	8	13	5	8	21	4	7	32
6	8	11	7	10	16	7	10	21	6	10	43	5	9	Inf.
8	10	14	9	15	35	8	15	71	7	13	Inf.			
10	15	28	11	20	87	10	19	Inf.						
12	20	53	13	26	Inf.									
14	25	114												
16	32	Inf.												

Lenses The choice of lenses for the vacation outfit has already been indicated, but the majority of amateurs have to be content with the lenses attached to their cameras when purchased. Usually this is a rapid rectilinear of good quality and medium focal length embracing a view-angle of about 53° on the longest way of the plate. If the lens works at $f/8$ with fair definition it will answer all ordinary requirements. When much architectural work or interiors are in view, a wide-angle lens offers obvious advantages as an inexpensive addition to the outfit. If possible, this lens should fit into the flange of the lens ordinarily used. An anastigmat, working at $f/5.6$ or $f/6.5$ gives added power for high speed

work, photographing moving objects on dull days and in working generally during the early or late hours of the day. For special long-distance work a telephoto attachment is necessary. Of the attachments in the market, the Bausch & Lomb Hand Camera telephoto attachment is the most efficient and least expensive. For occasional use a pinhole attachment, e. g., the Century Pinhole Device, is a desirable addition to the outdoor equipment. All lenses to be taken on the vacation should be carefully examined and cleaned by gentle rubbing with an oft-washed soft linen rag or the softest vegetable tissue used by opticians. Examine the iris diaphragm also and see that its sheaths work freely and smoothly and are free from dust.

Color-screens If a color-screen for orthochromatic work is included in the equipment, this should be thoroughly tested in practical use before leaving home, so that the worker is familiar with the increase of exposure required when it is used with the lens and plates ordinarily employed. If possible, take a color-screen which is properly adjusted for the plates with which it is to be used.

Tripod For vacation work a good and really reliable tripod is even more essential than when we work near home. Choose one which is fairly heavy in build, made on common-sense lines, and which is absolutely rigid when extended. The collapsible metal telescopic tripods are to be preferred if portability is insisted upon. If the tripod chosen has a loose headscrew, make sure that an extra screw is car-

ried for the emergency which is inevitable. Mellen's famous little tripod stay is an indispensable aid for keeping the tripod steady and firm when extended on slippery, uneven places, such as rocks at the shore, in hilly work, and for the smooth floors of churches, show places, etc. For windy weather work outdoors a net bag, which can be filled with stones and suspended as a weight from the tripod screw, is a big help.

As substitutes for the tripod where this cannot be employed, as at the World's Fair, where railings interfere, or up a tree, a ball-and-socket clamp or a bicycle clamp will often be found useful.

Of the carrying-cases obtainable from dealers, those providing two sections end to end, or three sections if lenses or extra shutters are taken, are preferable to the square box form. A small "dress-suit case" is often more desirable and gives ample room for conveniences. Among mountain climbers and pedestrian clubs the favorite carrying-case is the rucksack, a stout canvas bag with an arrangement of straps so that the loaded bag can be carried comfortably, knapsack fashion, at the back of the shoulders. A rucksack 17x19 inches will provide room for a 5x7 plate outfit and traveling necessities for three days, is exceedingly convenient in use and leaves the hands free. They can be obtained at moderate cost from sportsmen's and tourists' outfitters.

A light-weight, water- and dust-proof focusing cloth (not rubber) should be included in every outfit, ample enough to envelop the camera com-

pletely on occasion, but thin enough to be carried (folded) in the coat-pocket. This will provide a very desirable protection against wet and dust when working at the seashore, on a long tramp, or on an automobile journey over dusty roads.

The changing of plates, carrying films and packing plates and films after exposure in tropical countries, with similar details, will be dealt with in a later paragraph.

“How long, O Lord, how long?”
Outfit
Sundries murmurs the gentle reader. But patience. No holiday outfit can be considered complete without its sundries. Were we not taught as boys that we “could go through Egypt if we had—a dime, a knife and a bit of string”? Let the sundries list be as brief as possible. Two yards of red Turkey twill or Ruby Christia fabric for changing or temporary dark-room purposes; a knot of tough whip-cord; a small tin of liquid glue; a pair of compositor’s tweezers and a shoemaker’s awl. With these we are equipped for almost all emergency repairs.

For the vacation in which the
Camera and
Cycle cycle is the mode of transportation, plate-cameras, and especially magazine cameras, must be put aside in favor of roll-film apparatus. It is possible to carry glass plates on a bicycle, but the vibration, rattle and dust of the journey work mischief and risk failures. In short, every argument is in favor of the compact film-camera for the cycle holiday. There are many methods and devices for carrying apparatus on a bicycle. Common experience favors the thin, dust-proof case fitted snugly to the diamond frame.

Others pronounce in favor of the wire basket suspended in front of the handle-bars. A very compact outfit can be strapped to the vertical post under the handle-bar, or, better still, slung at the side by straps over the shoulder. But these details may be safely left to the cyclist himself, who invariably has emphatic opinions on how it should be done. If undue bulk and dust can be overcome, the cycle and camera are an ideal combination for a holiday, combining healthy exercise, change of scene and photographic pleasures at a minimum of expense.

We have now fairly covered the preparation and can take up practical work. A thousand things have been left unsaid for lack of space, but some of these will be gathered in as we go along. Let us consider a few typical holiday subjects, opportunities and difficulties.

Views from the Train Photographing from a train, steamer or other moving object is not altogether easy, but successful results can be obtained if a few simple points are remembered and the opportunity is favorable. I summarize the experience of Mr. G. G. Lewis [*Amateur Photographer*, 1903].

The rules governing the photography of moving objects from terra firma apply equally to photographing stationary things from a moving base. *First:* If the actual movement on the plate is not more than $\frac{1}{100}$ of an inch, the blurring of the image will hardly be recognizable. Make sure, therefore, that while the shutter is open, the image given by the lens on the plate or film shall not be able to move more than $\frac{1}{100}$ of an inch. *Second:*

If a moving object passes across the line of view, the displacement will be greater than when moving in a direct line toward or from the camera. Similarly, if the camera is being carried toward or away from the scene, the displacement will be less than if it is pointed at right angles to the scene. The difference is about one-third. *Third:* Objects near the camera will seem to pass more rapidly than distant objects. Suppose we are traveling in a train going at twenty miles per hour, our lens has a focal length of six inches and we set the shutter at $\frac{1}{30}$ second (twenty miles per hour equals thirty feet per second). No object nearer than 600 feet away should be included in the view.

It may be taken for granted, therefore, that with the ordinary hand-camera outfit only fairly distant views are possible, and we must choose the side of the train free from the disturbance of telegraph poles or other obstructions. As the train sweeps around a curve in the river or bay, or approaches a picturesque old town or a range of hills are favorable chances for exposures. An angle of about 30° to train's direction, pointed ahead, or the same angle, pointing back, should be chosen. Take a firm, well-balanced position at the window, leaning out somewhat if possible. Set the shutter at $\frac{1}{50}$ second (with fast plate and lens $f/8$); keep a watchful eye on the finder, and release the shutter at the right moment. With an anastigmat working at $f/6.5$ and a focal plane shutter, the difficulty of avoiding blur or movement is, of course, much less formidable. Success will depend chiefly upon the combination of the

favorable lighting on the subject, choice of view-angle and certainty of manipulation on the photographer's part.

From Steamers Photography from river steamers is easier than train work, because of the greater steadiness and smoothness of motion. There are no telegraph poles or obstructions, and abundance of light makes short exposures possible. Work from the bow of the boat, using view-angles of 30° to 50° to the side of the steamer. Hold the camera in the hand (not steadied on the side of the boat), and keep it level. Avoid including projections on the steamer itself. Remember that views of objects passing at right angles will require much more rapid exposures than where objects pass obliquely, approaching or receding from the steamer on which we work. Views including near moving objects are only possible with a quick lens and in bright light. The best time of day for pictorial work on the river is during the early hours of the morning or between 3 and 4.30 p. m. When the sun is low and obscured by light clouds, desirable effects can be had by working against the light. In this class of work a carefully adjusted finder and a focusing scale are important essentials.

On Board Ship Photography on board ship chiefly interests trans-Atlantic and trans-Pacific travelers. As pleasure voyages are usually made during the summer months, the photographic conditions are generally favorable to good work. This, strangely enough, will be largely confined to views leaving port, the life of the decks, an occasional cloud panorama, ar-

rival at the destination and, very rarely, wave pictures. On this latter point Mr. R. Child Bayley writes, in *Photography*:

“Anything short of a violent gale is almost unphotographable from a big steamer, where the standpoint is so high that all irregularities of the ocean surface, in the absence of anything to give a clue as to the scale, are dwarfed down into almost nothing. I have photographed in the Channel, in the North Sea, and in the Atlantic, when the wind has been so strong that standing steadily with the camera was very difficult, when the ship has rolled and pitched so that ‘the fiddles’ were insufficient to prevent a good deal of trouble at meal times, and when for most of the passengers such times passed by unheeded. The waves have been dashing over the bows; spray flying down the wet decks, yet in the photographs there was little or nothing to suggest that the sea was more than in the slightest degree choppy.

“The reasons for this are clear. The first is that already mentioned—the absence of scale. The second is that the deck of the steamer is a good many feet above the water-level, as a rule; and, unless the sea is very rough indeed, the horizon line is unbroken. A wave to break the horizon line must be, practically, higher above the general surface than the eye of the spectator or the lens of the camera. If it does not do this the result is quite unimpressive, as I have found by experience, after repeated attempts.”

Concerning general shipboard photography, I make room for an extract from *The Principles of Simple Photography*, wherein Mr. F. W. Sparrow

gives his experience, gained on ships in the British navy on the Mediterranean, West Indian and China stations. Latitudes 20° to 30° , corresponding to voyages to Great Britain, Egypt, etc., Cuba, Porto Rico and the Philippines. I quote:

As we proceed toward the equator the sun's rays strike the earth more vertically and their intensity is greatly increased, so we get a more brilliant lighting than would be expected in higher latitudes, combined with an increase in temperature. Thus latitude has a direct effect on photographic exposure. In the Mediterranean, Japan and similar regions the skies are cloudless during the greater part of the year, and scenes must often, therefore, be taken either in brilliant sunshine or not at all. As the shadows of such pictures will be very marked, the contrasts are extreme, and it is necessary to somewhat over-expose the plate in order to reduce them in the negative. Thus the actual shortening of exposure for these latitudes is not as much as would be expected; it is such as to make the difference between the use of fast and slow plates. These will be found to give better results than fast ones, and with the more intense lighting are all that can be desired for most subjects. The largest aperture of the lens need not be more than $f/8$, if that; with this almost any scene may be taken with a hand-camera under ordinary conditions.

The problem of maximum exposure becomes more complicated on board ship, as it must be remembered that blurring is produced by the relative motion of the subject and the camera. The motion of subjects has been treated in a previous

page, but now we are confronted with a more intricate problem—the motion of the camera itself during exposure. There will always be sufficient roll at sea to blur a time picture taken over the side. When taking a passing ship this relative motion must be considered; for instance, if you are steaming at ten knots, and meeting the ship moving at the same speed, an exposure corresponding to at least twenty knots must be given to ensure a sharp picture; whereas if she were steaming in the same direction a considerably longer time might be allowed.

If photographing from a heavily rolling vessel, wait until she is at her maximum angle of heel, and expose at this instant, when she will be practically at rest; never expose during a roll when your ship is on an even keel, as her motion is then greatest. Care must be exercised when taking pictures over the side that near ropes or staunchions are not included, as these, although perhaps unnoticed in a view-finder, will become large blurred lines across an otherwise satisfactory photograph.

Waves may be photographed with short exposures in a good light, but no hard-and-fast rules can be laid down as to the maximum exposure allowable: when taking a sea breaking over the bows from the fore bridge, the maximum exposure would be about $\frac{1}{80}$ of a second.

At the Seashore Photography at the seashore is so fully dealt with in THE PHOTO-MINIATURE No. 28 that the reader whose

holiday is to be spent by the sea is referred to that little book as a mine of information on this

special field and its difficulties. Here I make room only for a suggestive note or two on the subject :

A very few words will suffice concerning apparatus for photography along the coast. From personal experience with tripod- and hand-cameras, I very much prefer the latter as more convenient to handle under widely different conditions, and also as demanding less care and attention where one's mind is occupied with the subject. For some subjects, such as seascapes of pictorial interest taken from the shore, a tripod-camera is perhaps more satisfactory, but one can do so much with a hand-camera, as they are made now-a-days, that it is hardly worth while to add the burden of a tripod for occasional use. When a tripod is carried, it should be fitted with ball-and-socket joint, and the camera loosely fixed to the stand, to permit freedom of movement necessitated by the nature of the subject or other conditions. Among hand-cameras almost any variety will be found equal to ordinary requirements, although the better the instrument the better the results will be, as a rule. Whatever camera be used, a good finder is essential, and this should preferably be of the kind which permits one to see the view from behind instead of being obliged to bend down over the camera.

In the matter of lenses, an ordinary single-view lens will give thoroughly satisfactory results, and there is no need to look further until this is found to lack in capacity. A good rectilinear, such as Darlot's Rapid Hemispherical with a working aperture of $f/7$, will be found most generally useful; one with a focal length longer

than the base of the plate should be chosen. Where two lenses are available, a long-focus objective for general use, and a short-focus wide-angle lens for occasional work, such as yachts at short range, may be carried with advantage. The lens should invariably be shielded from dampness or flying spray when working near the sea. This can be accomplished in some measure by the use of a shutter working in front of the lens such as the Thornton-Pickard "T. & I." When a diaphragm shutter is used, as will generally be the case in this country, the lens should be protected by a piece of oiled silk large enough to cover both lens and shutter. This may be readily removed before actual use of the lens, and should be replaced after the exposure has been made. It is well, also, to rub a little oil over all the metal fittings of the camera to prevent rust, which is a frequent annoyance when working at the seashore. Since there is frequently considerable color-contrast when working near the sea and it is frequently desirable to include the sky with the subject, a color-screen will be found valuable to subdue the excessive intensity of the blue rays.

In seashore work, general opinion seems to favor the use of films. These do not need backing as plates do, to avoid halation, and are preferable in many ways apart from their light weight and convenience of handling. In photographing passing boats, in making surf pictures and so on, it is often necessary to change one's plate quickly, and this can be done much more quickly with roll films than with glass plates. Especially is this desirable in yacht photography or at re-

gattas, a class of work we are very likely to meet with during a holiday spent along the coast.

Photographing Yachts Yacht pictures can sometimes be secured from the end of a pier or dock. A still better vantage point is the stake boat when a race is on. But the most successful photographs, showing life and motion, are usually secured from the lower viewpoint of another boat navigated to meet the desires of the photographer. In working from the deck of an excursion steamer the manipulation of the camera does not present much difficulty. When one has to work from the deck of a boat or tug, as is often the case at regattas or races, success is not so easy of accomplishment, and depends as much upon self-control as upon photographic skill. A good deal depends, too, upon one's knowledge of the best views of this or that class of craft under varying circumstances, for a vessel viewed from different viewpoints presents widely different aspects, and every kind of sailing craft has its own peculiar characteristics, which should be secured in the picture. A broadside view rarely gives the most favorable impression and is difficult to secure, because the speed of the vessel is more difficult to contend with from this viewpoint than from others. A three-quarter front-view, on the other hand, will generally offer good curves and a pleasing *ensemble*, with plenty of life and "go." When a yacht approaches, bowfore, with the water beaten to a froth beneath her bow, a very satisfactory result may be secured if one has a steady hand and knows just when to release the shutter. When first seen on the finder

an approaching boat seems to move comparatively slowly, but when within hailing distance she will increase in size and seem to suddenly fill the view with her canvas. When to expose in such circumstances can only be learned from experience and the use of an accurate finder. The novice should not forget that the successful yacht-studies seen in the shop-windows represent many failures, even if they come from workers famous in this specialty. Steamships, or sailing vessels with abundant canvas, usually give the best view three-quarter front; sometimes a broadside view will be pleasing if we can have a cloudy sky behind to throw the sails into relief and give a sense of atmosphere. A rear view of a steamship will rarely be satisfactory, but if we get a full-rigged sailing vessel stretching all her canvas against the sun, a charming semi-silhouette effect may be secured, adding sentiment to the picture. This effect is emphasized if the sun be low and the sky marked by horizontal lines of cloud indicating repose. Pictures of small vessels lying at anchor in still water, such as may often be made from the wharves or docks of a harbor, are very pleasing if treated pictorially. The lighting of the subject is here a matter of importance, and this should be so managed that shadow effects on the water are made to help the composition.

Street Scenes For those whose holidays take them into the streets of cities at home or abroad, the scenes and incidents of urban life, often strangely picturesque, offer as interesting a field of work as the hand-camerist could desire. Here, again, it is unnecessary to discuss the

subject at length, as it is already very completely covered in THE PHOTO-MINIATURE No. 14. The following hints will be helpful to those who have not the above number at hand for reference. I quote from Mr. Walter Kilbey's excellent manual on *Hand-camera Photography*: In photographing street life the method of holding the camera is all-important. I am a great believer in holding it, if possible, at the height from which the particular view is generally seen. Some advise that the camera should always be held at a height of about three feet, i. e., in front of the chest, or under the arm, but undoubtedly the best position when taking street scenes (that is, the kind known as general views) and similar subjects, is on a level with the eyes. Landscape, marine and studies of a like nature are better taken from the height of the chest.

One great secret in street work is to make as little show of the camera as possible. You should never be seen fingering with the shutter or the lens as you approach the figure or group. Have everything ready before you get very close—the stop adjusted and the focusing scale set—generally at fifteen feet for one or two figures, and twenty feet for groups of three or more. Advance on your figure, holding the camera down at one side or behind you until you reach the spot at which you decide to expose. Then quickly raise it, take a rapid glance in the finder, expose, and quickly pass on. Keep the camera just as unobtrusive after exposure as before, because you may come across the same people later on; or you may have forgotten to draw the slide and want another

shot at the subject. But if you let every one know what you have done, the chance is gone.

If you come suddenly upon a figure or group, do not stop to adjust the camera, but slowly walk by, altering the scale or shutter as you may think necessary, and then return to your first spot. If any of the group have noticed you and stare at the camera just as you are about to press the button, lower your camera and pretend to be about something else. Light a cigarette, or do anything except allow your subject to guess your object. Keep your "weather eye" open, and in a minute or two you may find the opportunity to make another attempt. If the subject is a good one, you will not count the cost dear even though you may raise or lower the camera ten or twenty times.

Exposure As regards exposure for the slow movements in such subjects as the above, an exposure of $\frac{1}{30}$ second is short enough to give sharp pictures and long enough for full exposure, if used as below. I keep the shutter at one speed most of the day, and vary the stop according to the light, and this should form a useful guide.

<i>Time</i>	<i>Stop</i>	<i>Exposure</i>
Before 9 A. M.	$f/8$	$\frac{1}{30}$ second
9 A. M. to 2 or 3 P. M.	$f/11$ to $f/16$	$\frac{1}{30}$ second
After 3 P. M.	$f/8$	$\frac{1}{30}$ second, altering say to $\frac{1}{15}$ as the day wears on.

These exposures are for groups in light streets and market-places and in bright summer light, using the "quick medium" plates I have spoken of. If the day is cloudy, give twice the exposure;

if dull, four times; if very dull or overcast, eight times, but if working under conditions such as the latter, a rapid lens ($f/6$) is needed: it is twice as rapid as $f/8$. If in doubt as to which stop to use, as, for instance, $f/8$ or $f/11$, select the larger ($f/8$), for over-exposure can be remedied in development, but not so under-exposure.

When teams, street-cars and people in motion near to the camera are included, the exposure must be much shorter, not more than $\frac{1}{50}$ second for "end on" (coming toward or receding from you), or $\frac{1}{100}$ to $\frac{1}{200}$ for "broadside on," i. e., passing directly across the front of the camera.

As a very rough guide to the beginner, I would say that at $f/11$ and $\frac{1}{15}$ second exposure in fair light he will not go very far wrong all through the day.

One hundredth of a second is about the fastest speed a good roller blind shutter will work at, and this is not fast enough for many objects in rapid motion, such as football and tennis players, running and military sports, horse and cycle racing, active children's games, such as skipping or battle-dore and shuttlecock. For these a focal-plane shutter which works as fast as $\frac{1}{1000}$ of a second is necessary. The following table will give an idea of how short the exposure must be to get a sharp picture. So the reader will see that the focal-plane shutter is needed for many of them. As to whether, under certain conditions of light, the shutter exposures here directed will be sufficient, is another matter which can be settled by reference to exposure tables.

Rapidly Moving Objects

	Toward camera	At right angles to camera
Men walking, children playing, etc.	1-40th sec.	1-120th sec.
Cycling, ordinary	1-100th "	1-300th "
Pony and trap trotting	1-100th "	1-300th "
Man running a race and jumping	1-150th "	1-450th "
Cycle racing	1-200th "	1-600th "
Horses galloping	1-200th "	1-600th "

The table is made out for a distance from the camera one hundred times that of the focus of the lens; that is, for a 6-inch focus lens at fifty feet, a 7-inch at sixty feet. If the object is twice the distance, the length of allowable exposure is double, and vice versa. The exposure required for an object moving across the field of view equals the distance of the object in feet divided by 100 times the focus of the lens multiplied by the speed of the object in feet per second.

For street scenes and work of this "Fixed Focus" sort it is important to know the distances (in feet) beyond which all objects will be in focus on the plate. These hyperfocal (commonly called "fixed focus") distances vary according to the focal length of the lens and the stops used. The following table, given by Bolas and Brown in *The Lens*, shows at a glance the "fixed focus" distances for lenses of from 4 to 8 inches focal length, such as are generally used on hand-cameras. The hand-camerist who works with one lens only can, by memorizing the distances for his lens and its diaphragms, dispense altogether with the focusing screen and rely upon his focusing scale.

TABLE OF DISTANCES

At and beyond which all objects are in focus and may be considered as situated in one plane

Focal length of lens in inches	Diaphragm Apertures. (<i>f</i> / numbers.)										
	F/4	F/5.6	F/6	F/7	F/8	F/10	F/11	F/15	F/16	F/20	F/22
	Number of feet distant after which all is in focus										
4	33	24	22	19	17	13	12	9	8	7	6
4½	38	27	25	21	19	15	14	10	10	8	7
4¾	42	30	28	24	21	17	15	11	11	8½	7½
5	47	34	31	27	24	19	17	12	12	9½	8½
5¼	52	36	35	30	26	21	19	14	13	10½	9½
5½	57	40	38	33	28	23	21	15	14	11½	10½
5¾	63	45	43	36	31	25	23	17	15	12½	11½
6	68	50	46	38	34	27	25	18	17	13½	13
6¼	75	54	50	42	38	30	28	20	19	15	14
6½	81	58	54	46	40	32	29	22	20	16	15
6¾	87	62	58	50	44	35	32	23	22	17½	16
7	94	67	63	54	47	38	34	25	24	19	17
7¼	101	72	68	58	51	40	37	27	25	20	18
7½	109	78	73	62	54	44	39	29	27	22	20
7¾	117	83	78	64	58	47	42	31	29	24	21
8	124	90	83	71	62	50	45	33	31	25	22
8¼	132	96	88	76	68	52	48	36	32	28	24

In these tables and the foregoing pages the reader who spends his vacation at the World's Fair will find valuable help toward good negative-making. A brief survey of other conditions at Expositions of similar character will be useful. Necessarily, all the hand-camera work done at the Fair must depend on the finder and focusing scale; hence it is of vital importance that these should be correctly adjusted and that the worker be familiar with their significance and manipulation. On account

of the variety of subjects with rapid motion, a camera of the reflex type and focal-plane shutter will offer obvious advantages, but with favorable light conditions and careful management the ordinary hand-camera with its diaphragm shutter and a quick lens will be equal to most if not all requirements. The amount of local color in the Exposition buildings, the foreign concessions, the shows along the Pike, crowds and general decorative features, makes the use of ortho plates or films imperative. The experience of past Expositions also tells us that one backed or nonhalation plate is worth a dozen plates unbacked. Those who can spend only a few days at the Fair and want to secure as many negatives as is possible, should take a roll-film camera. This will permit the carrying of an extra supply of film in the pocket and avoid the delay consequent on having to change and pack exposed glass plates during a busy day.

As the distances involved in view-
Best Time to ing the different features at the Fair
Photograph are very considerable, and progress
will generally be difficult because of the heat, crowds and attractions on the way, much valuable time can be saved by carefully studying a good map of the Exposition grounds before any photographic work is attempted. It will be seen that the façades of the principal buildings face north and northeast, so that the early morning will offer the most favorable time for photographing architectural features. After 10 A. M. the light will be favorable for work along the avenues running east and west and the shows along the Pike. From 3 to 4.30 P. M. should be devoted to work around

the Fine Arts Building, the Cascades and terraces adjoining, and the United States Government Building and thereabouts.

**A Hint on
Focusing**

An example showing how the Table of Focal Distances will simplify the hand-camera work done at the Fair may be useful. Let us suppose that we are working with a lens of $5\frac{1}{2}$ -inch focus and $f/8$, and that we have a fairly correct idea of twenty-five feet as a known distance. Reference to the table on page 86 shows that if we set the indicator of our focusing scale at the 25 mark, all objects from 14 to 121 feet away from the camera will be sufficiently focused for all practical purposes, with 25 feet as the actual point of focus. Thus the scale can be fixed when we begin the day's work, and by keeping the focal distances in mind all further trouble about focusing is avoided.

Regulations

The regulations governing amateur photography at the St. Louis Fair are few and simple. No fee is charged for the use of cameras for plates or films $4 \times 5\frac{1}{2}$ or smaller, provided that a tripod is not used. Photographers should note that no object or exhibit in any of the Fair buildings can be photographed without the permission of the exhibitor concerned and the approval of the Director of Exhibits.

For night views showing the illuminations, a support for the camera will be essential. If this can be secured, nonhalation plates, a lens stopped to $f/22$ and exposures of $1\frac{1}{2}$ to 15 minutes, according to the subject and illumination, will give good results. Full information on night work out-of-doors is given in THE PHOTO-MINIATURE No. 31.

**Rainy-Day
Work**

Rural scenes on a wet day are generally too discouraging to tempt the photographer, but the amateur who has to spend a wet week-end in town may make good use of his opportunities. The pictorial beauties of a rainy day in town are chiefly owing to three things: First, reflections of buildings, persons, etc., on the wet pavement; second, the highlights on wet surfaces which in some instances almost give the effect of sunlight; and third (but by no means the least important), atmosphere.

For this class of work it is important to have the camera fitted with a lens working at a large aperture, such as $f/5$, $f/6$, or $f/8$. Below this, unless one gives exposures of half a second or one second, the negative will be under-exposed; and then, again, with these exposures it is impossible to take moving figures or vehicles. Rapid plates must be used, and they must be backed if the crisp high-lights of the wet surfaces are to be retained. Exposures of $\frac{1}{10}$, $\frac{1}{15}$ and, if there is a glint of sunlight, $\frac{1}{25}$ of a second will yield desirable negatives.

Orthochromatic plates are hardly necessary, as everything is toned down to a grayish monotone. Rainy-day negatives can be utterly ruined by lack of care in development. A hint in this department comes from Mr. John Beeby, whose wet-day pictures are well known for their fine qualities. His method, as given in *The Photogram*, is to commence development with a small proportion of developer proper and a large proportion of alkali, and to continue with this until the distance and middle distance appear sufficiently clouded over. The plate is well rinsed, and the normal developer

applied to impart the required degree of pluck to the foreground. A simple method of thus varying the development is to compound the formula, so as to require three parts of developer solution to one of alkali, and to reverse these proportions in the first stage of development. A suitable formula is: (A) Metol, 45 grains; soda sulphite, 1 ounce; water, 10 ounces. (B) Potass carbonate, 1 ounce; soda sulphite, 2 ounces; water, 10 ounces. At first use A, 1 part; B, 3 parts. Afterwards, A, 3 parts; B, 1 part.

**In the
Country**

According to statistics, the proportion of people who go inland to the mountains, lakes and rural districts rather than to the seacoast steadily increases year by year. However this may be, the holiday spent in the country affords an infinitely varied range of subjects for the camera. Landscape is without doubt the subject of dominant interest, after which woodland and water scenes, mountain photography, camp life and river trips follow in order. To deal at length with the country holiday's camera opportunities would mean the repetition of many numbers of *THE PHOTO-MINIATURE* already published. A few notes will, therefore, be given touching the most important branches only, with references to other sources of information readily accessible to the reader.

Landscape

For general landscape work the reader will find instructions and suggestions covering the selection and treatment of different subjects in *THE PHOTO-MINIATURE* Nos. 25 and 53. It is quite impossible to give a satisfactory summary in a few paragraphs. The

important questions relating to exposures out-of-doors are fully discussed, with simple tables and factors for all latitudes and conditions in *THE PHOTO-MINIATURE* No. 54, while pinhole photography, often so appropriate for outdoor rural scenes, is simply explained, with exposure tables, in *THE PHOTO-MINIATURE* No. 27. Similarly the photographing of clouds and skies, for which the country holiday affords so many opportunities, is systematically covered in *THE PHOTO-MINIATURE* No. 24. With these little books in his gripsack, the amateur can be sure of definite information bearing upon most of the subjects likely to be encountered during a rural vacation.

**Woodland
Scenes**

In this special field it is advantageous to have an outfit with both wide-angle and narrow-angle lenses. The wide-angle will often be needed for confined situations; the narrow-angle, on the other hand, will give better pictorial results where isolated bits are possible. In many cases a pinhole attachment will yield results altogether more desirable than can be obtained with any lens, by reason of its capacity for breadth and depth of definition. Nonhalation or backed plates should be used to avoid the blurred edges and halation inevitable when the outlines of trees project against the sky. Generally speaking, sunlight is not desirable for woodland work, although a sun-flecked path is a delightful subject when well rendered. Exposures should be as full as possible, to avoid harsh contrasts and spotty effects; on this account a quiet, diffused lighting such as comes after a rainy day is desirable. Good results can be had

on wet days, but the conditions for working are not pleasant. The foreground should have careful attention, and too sharp definition is to be avoided, $f/16$ being the smallest diaphragm which should be used. For early spring and autumn work in the woods, orthochromatic plates sensitive for yellow and green are indispensable.

For foreground studies of fern and woodland flowers, a careful reading of THE PHOTO-MINIATURE No. 13 is advised.

Mountain Photography Here, again, only a few words can be given to a branch of holiday work which deserves a book to itself. Successful negatives of mountain scenery are best made during the very early hours of the day or toward sundown. A single landscape lens is preferred by one expert, another advises a lens of fifteen inches focal length for a 5 x 7 plate; doubtless a convertible lens would solve the difficulty in the most satisfactory way. As great distances are generally involved, nonhalation plates or films and small lens apertures are recommended; the exposures will rarely exceed one-half second with $f/64$. Sir Martin Conway, an authority, advises the use of small plates or films (two inches square), and the camera should have ample movement in the sliding front.

Waterfalls A problem often presented to the photographer on vacation is the making of pictures of subjects which are so lighted as to have a great deal of contrast. Such subjects are, for instance, a waterfall with the sunlight full upon it and trees in the shade at the side of a stream. A brightly lighted brook with a dark-

colored bridge would be another example, and a white house surrounded by heavy foliage another. The average results of photographing such subjects are of the soot and whitewash variety, caused by an under-exposure of the darker portions of the picture and over-development of the high-lights, in an attempt to secure the detail in the shadows, which should have been attended to in the exposure. Many methods for correctly rendering such subjects have been suggested. A double-coated and backed plate exposed for the shadows and developed in a weak solution will do much toward correctly rendering great contrasts. With the ordinary plate, follow the old rule of exposing for the shadows and allowing the high-lights to take care of themselves, and help them to do this by developing in a strong solution heavily restrained with bromide. Another method applicable to many subjects is to calculate the exposure proper for the brightest high-light and the deepest shadow, and take the mean of these two exposures as the one to be given. For such an exposure, development is best started in the soda solution, carried along in a weak developer (to secure detail in the shadows) and finished up with a solution of normal strength in order to obtain the proper amount of density. Much can often be done by using a ray screen to decrease the contrast between blue water and green foliage, but the proper use of this little instrument has been so extensively treated of that further descriptions are unnecessary here. For pictorial purposes, the photographer will, of course, avoid landscapes where too great contrasts are a feature. For record

work, the double-coated and backed plate will undoubtedly be found the surest method of correctly rendering contrasts. [C. H. Claudy.]

Moonlight The beautiful moonlit nights among the mountains are sorely tempting to the amateur on vacation, but offer obvious difficulties as photographic subjects. Dr. D'Arcy Power, speaking of his experiences in California, states that exposures of from twenty minutes to an hour at $f/8$ will give desirable results with characteristic moonlight effects. Mr. C. H. Claudy, from experiments made in July and August, advises exposures of from five to twenty minutes with quick plates and a full moon. The moon itself is, of course, not included in the view. If some prominent light-colored object, such as a white country house or the roofs of a village, can be included in the view, so much the better. At high altitudes with snow, exposures may be shortened to one-half to one minute. Moonlit scenes in level country or very open views can be secured with exposures of twenty-five minutes.

Camp-fires To the envy of his friends, the photographic vacationer sometimes displays pictures of camp-fires in which the lighting apparently comes from the fire and night is represented by a dark background. Such pictures are usually made either by a flashlight operated in the usual way or by throwing flashlight powder into the fire. This latter is a somewhat dangerous proceeding unless the powder be pure magnesium. Pictures can be made, however, by firelight alone, and the genuine thing is usually much more

realistic than the artificial. Exposures will range from five to thirty seconds and should by all means be made upon backed plates. The brighter the fire and the shorter the exposure, the more satisfactory the picture will be. A very bright fire will supply sufficient light to photograph surrounding faces in a few seconds, and this few seconds of time will not be sufficient for the fire to form simply a blur upon the plate. The development of the fire itself can be helped by the application of bromide of potash solution on a small camel's-hair brush. The flowing lines of flame can thus be very delicately emphasized with advantage, but the faking must be skilfully done or it will be detected. [C. H. Claudy.]

Pictures at Night Oftentimes the holiday at the sea-shore or country resort will offer opportunities for night photography such as special illuminations about a country house, festival buildings, open-air theaters and pyrotechnic displays. Illuminated water festivals are peculiarly attractive. The possibilities and difficulties of this class of work are elaborately dealt with in THE PHOTO-MINIATURE No. 31, where the reader will find an abundance of practical information which cannot be summarized here.

Briefly: Night photography demands patience and enthusiasm, nonhalation ortho plates and a quick lens. Focus upon the principal lights in the desired view, choosing a point of view which will give diffused illumination and as few direct sources of light as is possible. After focusing carefully, stop the lens to $f/16$ or even as far as $f/22$, and give exposures varying from ten to twenty minutes on

well-illuminated scenes; for moving water, as an illuminated fountain, open the lens to its full aperture, $f/7.7$ or $f/6.5$, and give an exposure of one to two minutes. Development should be made with a much-diluted pyro developer, detail and a thin printing plate being aimed for.

In photographing fireworks, obtain a focus on the point of interest by a preliminary trial with a Roman candle. Place the plate ready for exposure and open the shutter a few seconds before the particular display wanted is set off. Many interesting pictures can be had in this way by quick and skilful manipulation. Quick plates and a lens at $f/7.7$ or better are essential.

We have now covered some of the subjects most likely to be encountered on a holiday. It would be easy to continue along these lines for another hundred pages and still leave subjects unmentioned, but we are dangerously near the limits of our all too brief survey. I will, therefore, draw the story to a conclusion with a few hints concerning photography in the tropics and the conditions characteristic of some of the more notable holiday districts abroad.

In the Tropics During a recent Cuban trip, much of the journey being along the sea-coast, Mr. W. N. Jennings accumulated valuable experience in the successful handling of films. I quote from his account:

1. Each spool of film is to be well wrapped in waxed paper. Keep the supply of films well in the center of the pack, wrapped in light underclothes—away from the influence of surface sunshine. Tropical sunshine burrows deep.

2. Make at least three exposures upon any desired object. Then you are sure of at least one good negative.

3. Arrange to discharge your kodak every night. Do not carry partly exposed rolls over night, as the white exposure figures become imprinted on the surface of the film very soon after exposure in the tropics.

4. Avoid candle or bright light ruby lamps. Melted wax is bad for good clothes.

5. Every night take each exposed roll of film, and if you cannot find a better place, make a tent for your hands under the bedclothes. Unroll the film away from the paper backing. Re-roll it upon itself on the spool. And then roll over it the black paper cover strip. This will prevent the painted number printing on the surface of the film and spoiling many a good negative.

6. Be sure to rewrap your exposed films in waxed paper and seal up the cardboard cartridge at both ends with passe-partout binding strip, to make it air-tight.

Supplies and dark-room accommodations can be had at the well-equipped store of Lychenheim & Company, O'Reilly street, Havana.

From the record of a trip in
India and the East India, Burma and the East, made by
 Mr. J. O. Neumann [Camera Club
 Journal, 1899], I glean the following items of
 interest:

Outfit.—Plates or films should be packed in a soldered tin. The plates should be backed. Leather should be avoided, as the dampness spoils it, and insects and other creatures eat it. The

camera should contain only polished wood and brasswork or metal; the latter must be kept well greased with oil or vaseline. Avoid India rubber; it gets "tired" and useless very quickly.

Exposures.—The shortest possible exposures between midday and 2 P. M. gave excellent results. Until 10 A. M., and often later, the exhalation of humidity from the soil, caused by the nightly rains, will render photographic attempts more or less precarious.

There are three things one must always encounter and guard against in the tropics, viz. (1) excessive dampness; (2) excessive light and absence of light-tight buildings, and (3) insects.

The dampness pervades everything, and combined with heat and light makes a formidable enemy. No one who has not been to the tropics has any idea of the number and variety of insects which are to be met with in this world of ours, nor of their propensity to get into the tightest corners, there to propagate their species, which in turn will devour films, etc. Take some black paint and paint the inside of your camera every month, and test for holes

Egypt On the Nile there are a few large towns, among them Assiout, Luxor and Assouan, where photographic supplies of a certain limited kind may be obtained.

The native guide is indispensable, cheap and, remarkable to state, very useful. With his aid and the generous use of the carriages in the cities and donkeys in the country (the hire of which is very reasonable), you can move around easily and quickly.

High noon is the proper time for photographing there, for you cannot (?) take time exposures, since the people will not keep still. Cairo is the most interesting place in Egypt to photograph in, for its attractions are many, its Bazars are the finest, and in its life is the most curious mingling of Orient and Occident. The Sphinx and Pyramids are near at hand. They should be visited in the morning, for then the light is right for taking them. A modern trolley leaves the west end of the Nile bridge for the Pyramids hourly on the even hour. The trip takes about forty-five minutes and costs fifteen cents each way, first-class.

As to supplies: In most parts of Egypt you can obtain films, but plates (except $3\frac{1}{4}$ by $4\frac{1}{4}$ plates) are not so easy to get, and when you do get them you will find they are usually of French manufacture and size. The prices are from 25 to 50 per cent higher than for the same in America. The Nile trip is made in express and tourist steamers and in private Dahabeahs. The private Dahabeah upon which I traveled, the "Serapis," was said to have a complete dark-room on board, but it proved to be little else than a convenient place to change plates and store apparatus. Excepting at Alexandria and Cairo and in the Delta, they have practically no rain, so you are always sure of clear skies. The light in the winter months (the tourist season) is good, but not so intensely so as one would expect, for Egypt is not so far south as we are inclined to think. The days are warm and the nights cold and the air intensely dry, which tends to affect the woodwork of your camera, which should be a well-seasoned one.

At most places you ride about on donkeys and you will have a porter carry your camera for you. The wise man does not allow this porter and his burden out of his sight. Have a stout, handy tripod along, also a flash-lamp for interiors and a receptacle for carrying plate-holders, light, strong and fairly light-proof. A changing-bag is very handy and saves worry should you be unable to find a suitable place to change plates in. It is a dusty country, so keep your camera and plate-holder as well protected as possible. I always keep my holders full of fresh plates, for you never can tell when you will want to expose all the plates you possibly can. I change plates each night, even if I have access to a dark-room, and repack the exposed plates in the original packages. In these I find they travel very well. [D. G. Archibald.]

Switzerland From a lengthy article in a recent issue of the *Photo-Gazette*, in which the Comte d'Assche chats of his experiences when on tour in Switzerland, we extract a few brief hints which will, we think, be noted with profit by those of our readers who are likely to spend a holiday in the playground of Europe.

Iso plates are almost indispensable to do justice to Alpine scenery, where a common type of landscape includes a foreground of dark green firs and a distance obscured by a light haze. Then, again, no other plate can reproduce such a subject as a glacier in full sunshine, reflecting light so blue and actinic that the eye can scarcely bear it. Without an iso plate and a yellow screen the dark slides yield harsh negatives, without half-tone, with bare

glass in the shadows and intense density in the lights. On ordinary plates, light summer clouds leave no trace of their existence. An iso plate exposed behind a suitable screen preserves the most delicate cumulus, and reproduces in its proper value the deep blue characteristic of the sky in high altitudes. A plate sensitive to yellow and green, and a screen necessitating about six times the ordinary exposure, are such as to give good results. The iso plates of Smith & Co. and Lumière are readily obtainable in Switzerland. Backed plates are preferable for almost all subjects.

Lenses.—A wide-angle, medium-, and narrow-angle should all find place, if possible, in the outfit. For quarter-plate, say, a set of 4, 6 and 10 inches focus, the wide-angle for use in gorges, at the feet of high mountains, or in towns like Lausanne, Berne and Fribourg, where the streets are narrow and steep; the medium-focus for views on the level, for instantaneous exposures; the narrow-angle for distant views from the edge of a lake or summit of a mountain.

Carrying.—The straps for supporting apparatus from the shoulder are always made too narrow. I got a shoemaker in Zermatt to cut me a piece of thick leather, such as is used for the soles of boots. This strap, about a quarter of an inch thick, was cut in elongated oval shape, about 10 inches long and $2\frac{1}{2}$ inches wide. Making a slit at each end, through which the strap of the camera-case was slipped, the width and thickness of the leather prevented the pressure of the camera-strap from becoming at all irksome. The plan is simple and quite practical.

In ascending a mountain, the camera is best carried on the back by the same strap, used as follows: Slip the right arm in the strap, place the bag in the middle of the back, and insert—from behind—the left arm into the strap. The broad piece of thick leather (occupying a central position on the camera-strap) now comes between the shoulders, the camera-straps pass under the arm-pits, and retain the bag firmly in position without pressure on the breast, the strain to be sedulously avoided in mountaineering.

Swiss Dark-rooms.—Development is best postponed till the return home. The dark-room which figures prominently on the prospectus of many Swiss hotels is generally so roughly fitted as to serve for nothing more than changing plates, and even for that it is advisable to use your own ruby lamp or changing bag.

Other Countries Information regarding photography in Germany, France, Belgium, Italy and Spain, as far as forbidden localities are concerned, permits to photograph, etc., as well as regarding permits for show places in Great Britain, can be obtained from the *Figures, Facts and Formulæ of Photography* or Wellcome's *Exposure Note-Book*.

Finis Nothing has been said about development on vacation, for the simple reason that this process is best left until one arrives home and has ample time and facilities to make the best of one's precious exposures. The packing of exposed films has been mentioned by Mr. Jennings; plates are best repacked face to face in lots of six, wrapped in black paper and replaced

in their original boxes, which should be again wrapped in black paper, and stored in the center of a trunk, where they will be well protected against damage during transportation by land or water.

BOOKS

The following list, as already mentioned, offer a great deal of supplementary information on the subjects dealt with in this monograph as belonging to vacation photography:

Technics of the Hand-Camera, for advanced workers. By W. B. Coventry. 90 pp.; diagrams. 1901. Cloth, \$2.50.

Hand-Camera Photography. By Thomas Kilbey. 121 pp.; illustrations and diagrams. 1903. Paper, 50 cents.

Pictures and Pointers for Amateurs. By G. E. Mellen. 10 cents.

The Hand-Camera. By W. Welford. 105 pp. 1901. 50 cents.

Nature and the Camera. By A. R. Dugmore. 126 pp. 1902. Cloth, \$1.35.

Panoramic Photography. By G. E. Mellen. 30 pp.; illustrations. Paper, 25 cents.

Elementary Telephotography. By E. Marriage. 118 pp. 1901. Cloth, \$1.75.

Notes and Comment

After exhaustive tests of the many anastigmats in the market, the Geological Survey Department at Washington has been equipped with Cooke lenses. This endorsement of Cooke lenses is one worth noting, and agrees with the result of similar tests made by the astronomical observatory at Harvard College.



The annual conventions of the National Photographers' Association are usually overlooked by the amateur photographer as offering little in common with his interests. This year, however, the convention of the Association will be held at St. Louis, conveniently accessible to those who visit the World's Fair during convention week, October 3 to 8, inclusive. We urge our readers to take advantage of this convention. Its sessions, held during the forenoons only, are short and present many features of practical interest. The exhibition of professional photography, which forms a noteworthy attraction of the convention, represents the best professional work of the year and will repay a visit. Information as to membership, railroad and hotel concessions can be obtained from the secretary, Mr. G. G. Holloway, Terre Haute, Indiana.



With regret we record the death of Mr. James F. Ryder, which took place at Cleveland, Ohio, on June 2.

Mr. Ryder was one of the fathers of American professional photography. He began his course as a traveling daguerreotypist in 1847, and took an active part in the progress of his profession until his retirement from business ten years ago. During the earlier years of his career he traveled through many states and encountered many strange experiences, the story of which is interestingly told in a volume of reminiscences titled *Voigtländer and I*, published two years ago. Mr. Ryder enjoyed the personal acquaintance of almost all the men notable in his profession during

the past half century, and twice served as president of the National Photographers' Association. During the seventies he introduced in this country the art of retouching portrait negatives, and in 1889 he inaugurated the movement which resulted in the erection of a statue to Daguerre at Washington, D. C. He is survived by his widow and a brother, Mr. Philip S. Ryder, a photographer at Syracuse, N. Y.



The Infallible Exposure Meter Company, 237 B South 4th street, Brooklyn, N. Y., asks us to mention that (1) readers who buy Infallible meters from dealers should make sure when purchasing that they get complete outfits, including the instruction book, speed card, etc.; (2) the Company will gladly put any old-style Wynne meter in perfect order, supplying a new dial adapted for use with the new sensitive paper, etc., for the normal charge of 50 cents; (3) a new Speed List will be ready about July 1, showing changes made during recent months in the speed of American plates; (4) a new shipment of Infallible Shutter Testers has been received and orders can be filled promptly.



A representative collection of recent work by Mr. Alvin Langdon Coburn, of New York, was exhibited in the art galleries of the Pratt Institute, Brooklyn, May 4 to 21. The prints comprised examples of portraiture, landscape and illustration work, displaying unusual skill in the treatment of the subjects. We are pleased to hear that Mr. Coburn, whose studio on Fifth avenue has been open only a few months, is meeting with considerable success in professional portraiture.



The \$500 prize competition announced by *The Photo-American*, 20 Hoyt street, Stamford, Conn., is arousing much interest among amateur photographers and should not be forgotten by readers of these pages. The editor of *The Photo-American* has a truly catholic taste in art and an unerring eye for the real thing. Send a stamp for particulars of the contest.



The most complete guide to the new cameras and novelties of 1904 we have yet seen is the fourth edition of Hirsch & Kaiser's catalogue, just published. All the styles and

sizes are here described in detail, the text being accompanied by many illustrations. Apart from this feature the catalogue covers 100 octavo pages, listing almost every help and convenience obtainable for amateurs and professionals. Messrs. Hirsch & Kaiser, located at 5 and 7 Kearny street, San Francisco, have an enviable reputation on the Pacific coast as business men of enterprise and unfailing courtesy. Their catalogue, which can be obtained for the asking, should still more firmly entrench them in the affections of the photographers of the far West.



The Troy (N. Y.) Camera Club is a comparatively young but flourishing organization doing a good work in Troy by stimulating an intelligent appreciation of photography among the amateurs of that city. It has an active membership of almost a hundred enthusiastic workers and is growing rapidly. Informal meetings are held every Monday evening, at which subjects of practical interest are first dealt with by a competent authority and later discussed by the members present. Photographic outings are an attractive feature in the Club's work and an exhibition is being arranged, to be held in the autumn. Among the more active members Mr. Albert MacNaughton deserves a word of recognition. Mr. MacNaughton is the photographic editor of the *Troy Budget*, and his interesting department in that paper has undoubtedly contributed in no small measure to the growth of the Club and the popularity of photography as a hobby in Troy and vicinity.



Litmus paper is used to indicate the alkalinity or acidity of solutions used in photography. It is vitally important in toning printing papers where success depends on the alkalinity or acidity of the toning bath according to the method in use. To test a toning bath for acidity, immerse a piece of blue litmus paper, the presence of acid being indicated if the paper turns red. To test for alkalinity, immerse a piece of red litmus paper, the presence of alkali being indicated if the paper turns blue. A toning solution in which neither red nor blue litmus paper will change color is necessary in toning some papers.

Blue litmus paper can be obtained everywhere, but really reliable red litmus paper of good quality is rarely to be had when most needed. To meet this difficulty Burke & James, of Chicago and New York, have introduced a

first-class red litmus paper of the proper color and sensitiveness, put up in glass vials with screw tops and guaranteed to retain its sensitiveness for a very considerable length of time. By asking for B. & J. Red Litmus, the reader can always be sure of reliable paper and thus avoid trouble and disappointment.



Half an hour spent in looking over some specimens of photographic advertising submitted by Mr. W. I. Scandlin, Brooklyn, N. Y., forcibly reminds us that Mr. Scandlin is putting out some remarkably good things which possibly are not as widely appreciated by photographers as their quality merits. We would again suggest that our professional readers should get into communication with Mr. Scandlin with regard to publicity matter, business-bringing booklets, an advertising campaign, etc. The intelligent use of Mr. Scandlin's booklets can only result in an increased volume of business. We commend his advertising service to all who depend upon photography as a means of livelihood.



Under the auspices of the Metropolitan Camera Club, a new organization of amateurs and others interested in photography in New York city, is announced the First American Photographic Salon, to be held at the Clausen galleries, December 5 to 17.

The names of well-known painters appear on the jury, the patrons are headed by Secretary Hay, and embrace other distinguished art patrons and political luminaries, and the Committee, under the chairmanship of Mr. Curtis Bell, numbers thirty-three members, distributed from Oregon to Boston.

It is promised that all prints submitted will be passed upon by the jury. As no special prizes are offered, it is to be assumed that the honor of acceptance is to be the only recompense. Whether this will attract notable European exhibitors must remain to be seen. November 12 is the last date for receipt of prints. Further particulars may be had from the Chairman, whose address is 102 West 101st street, New York.



The latest price-list of photographic lenses and accessories manufactured by C. A. Steinheil Sons, Munich

(Germany), comes to our table from the Fidelity International Agency, 621 Broadway, New York, the American agents.

The preface defines, in a very clear way, the distinction between the Rectilinear, or older type of lenses, the Antiplanets, intermediate in properties between these and the modern Anastigmats, of both cemented and uncemented construction. In each of these classes the manufactures of Messrs. Steinheil have a well-merited reputation. The detailed descriptions of the capacities and qualities of the various sizes and formulæ are accompanied by specimen results, which well uphold the claims made for them.



The Kodak Catalogue for 1904, obtainable from all dealers, shows that this well-known line of cameras and specialties makes steady progress in anticipating and providing for the amateur's needs. Many improvements are embodied in the outfits already favorably known and new models are offered with peculiarly attractive features. Among these latter the No. 4 Screen Focus Kodak deserves special mention. Those seeking a vacation outfit will be difficult to please if they do not find all their requirements supplied in the Kodak list.



Home Portraiture, by Frank M. Steadman, is the title of a little book published by the Eastman Kodak Company (Paper 25 cents; leather 75 cents), which seems likely to revolutionize the methods commonly employed in making portraits at home. In place of theory and general instructions Mr. Steadman gives plain directions where and how to place the sitter, arrange the lighting, set the screens, etc., with a simple guide to exposure by the Steadman Solio-Time System. Many diagrams accompany the text. Every amateur should have this book and follow its instruction carefully.



A Federation of American Photographic Societies: At the call of the Metropolitan Camera Club of New York, representatives of the principal photographic societies of the country met in the rooms of the Metropolitan Club, No. 102 West 101st street, a few days ago. Plans for the federation were conceived and executed by Mr. Curtis Bell, president of the club. Representatives were

sent by the Boston, Washington, Toronto, Philadelphia, Chicago, New York and Brooklyn societies and also the Salon Club of America, which is devoted to pictorial photography, with members scattered all over the United States.

Mr. Bell called attention to the present difficulties and expenses connected with holding Salon and other exhibitions of pictorial photographs and showed that by organization and unity of purpose far more could be accomplished than by individual efforts of the several clubs, and with far less expense. Among other plans proposed was the holding of an annual photographic Salon of the very highest class, the pictures to be judged by artists and the selected work to be forwarded in turn to all societies in the federation. As this collection of pictorial photographic work cannot be shown in more than a dozen large cities during the season, the number of societies to be admitted to Salon membership was limited to twelve. In addition to this, for the education of people in other cities, interested in this great photographic movement, a smaller but very select exhibition was proposed, to be prepared quarterly and forwarded, in turn, to the societies which shall be known as exhibition members.

Interchange of members' privileges was proposed, and also a historical department for preserving photographs of interesting landmarks, old buildings, quaint local customs, etc., the results of the year's work in that department to be filed in some institution of national importance, as, for instance, the Smithsonian Institute at Washington. All these subjects were fully discussed, and it was unanimously agreed that the objects of the proposed federation were worthy of the best efforts of all photographic societies, those represented assenting to the plan in its entirety.

It was decided to name the new organization "The American Federation of Photographic Societies." After the adoption of a Constitution, the following officers were elected for the ensuing year: Curtis Bell, New York, President; Walter Zimmerman, Philadelphia, First Vice-President; Charles E. Fairman, Washington, Second Vice-President; F. Dundas Todd, Chicago, Third Vice-President; S. C. Bullenkamp, New York, Secretary; John H. Thurston, Boston, Treasurer; Rudolph Eickemeyer, Jr., New York, Salon Director; Daniel Baker, Philadelphia, Historian; F. C. Beach, Toronto, Chairman Salon Committee.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

JUNE, 1904

Number 63

Photography in Advertising

In photography and in advertising, as in most other forms of human activity, there is the old idea, expressed by formalism and convention, and the new idea, characterized by breadth of view and elasticity. We are all familiar with the old idea in advertising—the bare announcement in cold types, a plain, unvarnished tale. And in photography we had the old idea of two classes, distinct, separate: the professional who made photographs of men and things for money, as a business; and the amateur who photographed for the love of it—*con amore* as the phrase went—and who was supposed to lose caste if he accepted cash for his work with the camera. We have changed all that. The new idea in advertising calls for a profusion of attractive, persuasive illustration, preferably by photography. In this the modern amateur perceives a field of work wherein his hobby can be made self-supporting or perchance profitable. This little book is wholly concerned with the new idea—photography in advertising, and its significance to the man with a camera.

**Yesterday and
Today**

Less than a score of years ago the pictures used to illustrate advertising matter were either wood-cuts or zinc etchings in line from pen-and-ink drawings. Compared with the illustrated advertisements of today, these were necessarily crude, heavy and inartistic in effect. The really worthy wood-engraving was, of course, too expensive for general use in advertising; the zinc line-cut was, in turn, dependent for its attractiveness on the skill of the commercial pen artist employed by the engraver. As a result, it was generally lacking in the finer or pictorial qualities of the good pen-and-ink sketch. The great difference between the old illustrated advertisements and those of today is due, first, to the widespread use of photography as a method of illustration, and second, to the perfection of the half-tone engraving process and the modern printing press. By combining these we are now able to illustrate advertisements with reproductions possessing all the beauty of the wood-engraving plus the life and actuality of the photograph. To such a degree of perfection has this use of photography been pushed that the advertising pages of our magazines fairly rival the reading pages in interest and pictorial attractiveness. Nay, more, the usefulness of photography in the illustration of advertising matter is now so widely appreciated that the photograph enters into every well-considered scheme of publicity, either to draw attention to the reading matter or to demonstrate the desirability, advantages or actual use of the thing advertised. This use of photography finds new applications on every side.

The Field and the Amateur This simply means that the illimitable field of advertising is an open market for the sale or disposal of photographs which will help to sell goods, and in this market the amateur who can produce the right sort of work has as good a chance to dispose of it profitably as the specialist who devotes his whole time to the work. The one thing essential is that the photograph shall have that quality which will compel attention and help to create a demand for the goods advertised by showing their advantages, uses or attractiveness. This applies everywhere, in selling real estate, marine engines and house furnishings, as well as in selling candies or wearing apparel. Just as the illustration is used to round out and add interest to the story, so in advertising the illustration must round out the argument of the advertiser, showing the reader *how* and *why*, riveting his attention to the thing advertised and adding to its interest. The closer the connection between the illustration and the article advertised, so much the more helpful is the illustration and the more valuable to the manufacturer concerned.

Things Better Left Alone So much for a general survey of the field. In every-day practice it is found best to leave technical illustration to the specialist who is equipped for this work. In the advertising of real estate, furniture and similar purely commercial lines, the amateur cannot expect to compete successfully with the commercial photographer who brings to the work special facilities and trained knowledge. Nor is it desirable that the amateur attempt such

classes of work. There is abundance of scope outside these special lines, and especially in pictorial illustration, well within the capabilities of the amateur with artistic ability who is willing to find out what is wanted by the advertiser. Of this field the illustrations and suggestions given herein offer plain demonstration.

Pictures, not records, are sought by the advertiser; and the more attractive the picture, the greater its value from the advertisers' standpoint. Almost any one can make records with the camera, which means little more than making negatives of anything and everything, buildings, houses, streets, landscape, snow scenes, and the usual miscellaneous riff-raff of that sort. But this kind of material is not available for the attractive advertisement, and a very small demand awaits the photographer producing this class of records, for they lack the picture element and revert to the ordinary photograph, with which the public is already satiated. Every illustrated paper or magazine reeks with it, the shop-window is filled with it, and it is given away for the asking—as a premium for soap, food, tea and groceries galore! It finds its way, as well, into the patent medicine, tobacco and cosmetic trades and as an inducement to purchase all sorts of household supplies, and hundreds of other things that are piled upon the market for daily use.

Advertising is really a department of literature and art, and the same elements that cause a book to be read and talked about will cause an advertisement to be read and talked about. Of all the

Room for
Good Work

books that are written in a year and the pictures that are printed in the magazines, very few remain with us—the rest are chaff and are soon forgotten.

It is just so with advertising. How much of the great mass of stuff written and printed is really worthy? And how many of the pictures appeal to us so strongly that we can remember them for any length of time?

The spirit of a concern or manufacturer should be represented by its advertisements and the class of pictures they display, for the public is prone to judge the advertiser from this viewpoint; and yet how much of the advertising sent out is inadequate both in conception and execution; and, to make it still worse, poor illustrations often mar rather than improve the reading matter. This can be seen on every hand in the magazines, and often in the little booklet that reaches the home or office through the mails. The idea is good and perhaps an illustration or two, but the greater part of the work is bad and deters rather than enhances the sale of the advertised goods.

How Pictures Help That all branches of trade are required to advertise is clearly shown in the advertising columns of the papers and periodicals. Even the largest combinations, such as the Standard Oil Company, and other great industrial interests, will, at times, bring to the notice of the public certain things that were perhaps unknown, and here the inevitable photograph bobs up serenely and shows how the product is used or applied. For example: in past years paper caps were cut and tied over the

tops of jelly glasses and preserves, but latterly another method has been in vogue. The Standard Oil Company has a large quantity of paraffin as a result of the oil-refining process, and one day a happy thought occurred to some one, and a photograph was shown to one of the principals of the Company of a pretty girl capping jelly glasses. The paraffin proposition was recalled and the experiment was tried of using melted paraffin to flow over the tops of the jelly, jam or preserves and adhere to the cleansed and dried sides of the glasses or jars. It met with such success that it was advertised in connection with the picture showing the act, and a new market was created for paraffin.

So it is with thousands of other things; a mere statement often falls flat for want of a reader, but just connect it with the right sort of a picture, and every one who sees the picture will see the point of the story at a glance.

Some years ago the merchants of our large cities could put their cards in the newspapers and tell people that they sold certain kinds of goods, and people would go and buy; but that was a long time ago, and yet it is possible to find in many bustling cities today scores of concerns who have not awakened to the fact that the older methods are no longer potent. The world moves forward, conditions are changing, the taste of the great public is becoming more cultivated, and its appreciation of the attractive announcement grows keener every day. The hackneyed thought, the commonplace printed matter, and the ordinary picture, have no place in modern advertising.

Illustration is a powerful factor
The Mission of the Illustration in advertising matter,—it decorates, attracts, explains and emphasizes.

It has the power to arrest the hurried glance and lead the reader naturally and gracefully into the text, which might otherwise have passed over unnoticed.

This in magazine advertising is an important thing, and yet the average advertiser does not comprehend fully just how important it really is, and it is the hardest problem with many of the agencies to steer the old-time advertiser away from the plain type advertisement into the fertile fields of the picture gallery. Once convinced, however, of the practical value of illustration as a means of attraction, the advertiser is generously appreciative of work which he can use, and willingly pays for what will help his advertising and make it more effective.

The photographer helps the advertiser into this new field, and if his pictures are of the right sort, they will suggest, create and produce magazine advertisements which embody those elements that attract, hold and impress and convince the beholder that what the type explains must be so.

There are few departments of advertising where these same elements are so vital and yet where they are more sadly lacking. Pick up any magazine and glance through it, and you will find that the advertisements that strike you are the exception; the great majority "all look alike."

A Vital Point When an advertiser buys space in a magazine, only the first step has been taken; the vital point is what is put

into that space, and upon this depends the number of sales that particular advertisement will bring. It is far better to have the blank page with but a few lines of descriptive matter at the center than to crowd it full of design and reading matter that no one is interested in. The crowded advertisement simply confuses and tires the reader, particularly if an ordinary and uninteresting picture is embodied in the display.

The point is to make the advertising matter so good that instead of considering it a favor to have folks read it, they will consider it a favor to be permitted to see it. This can best be accomplished with the aid of photography.

Any one can write a smooth sentence, but merely good English is not always good advertising. To describe a rose so that one may fairly smell its sweetness; to infuse into a sentence that subtle power to awaken imagination, to impart life, reality,—that is the art of description, and the sort of literature that arrests the attention.

To make a picture and miss the essence of the expression, to lose the vital point of concentration and thought, is to render it a mere record and unworthy the name of picture.

Any one can be taught how to use the camera, as any one not blind can see at every turn, but to make pictures depends on the ability of the man behind the camera, his ingenuity and originality.

Folks are not coming around with
The Public a search-warrant to see what you
Point of View have that is worth buying, and the
 advertiser realizes this as keenly as the purchaser.
 The goods and their use must be continually

placed before the mind of the public to receive the proper amount of recognition, and today, more than at any time, photography opens the way for business in this class of display advertising.

It is not enough to say that a certain toilet-powder is to be used in such and such a manner, and that it is delightful for so and so; the advertiser goes further than simply showing a photograph of the box to make you familiar with it, as well as his face on the cover as a trade-mark. Each separate use to which the powder is put is photographically shown to the prospective purchaser, and this not only applies to one manufacturer, but to many that have adopted the photographic illustration as the best means of displaying the virtues of their wares to the public.

It takes courage to write what we think, and dexterity to photograph that which we imagine. The sentence that we formed on awakening, or over the coffee-cup, or on the car, and which seemed just the right thing, full of fire and life and truth, takes the nerve out of us when we get it on paper. We say that will never do,—it is too spontaneous, it came too truly from the heart, and, some way or other, we are half ashamed to let other people read it. And so we cut it down, prune it into more conventional lines, and lo! the spontaneity, the life and vigor and charm that it had are gone.

So it is with the impulsive photograph, taken on the spur of the moment without forethought or planning,—it is full of fire and happy in

thought, but, perhaps because it appears to be too truthful, it is reworked and conventionalized, until, as a result, it is worthless, and brought to the level of the commonplace.

Stick to your first love, submit the original idea, and if it is too far beyond, too practical for illustration, it is easier to prune it into shape than to build it up. Everybody is glad to see a good picture, hear a good thought well expressed, or to become acquainted with a good man. The door is always open to such, for human nature is pretty much the same; it varies a little in external expression, but, down under the skin, men are men, with eyes that read, ears that hear and hearts that feel.

Perseverance The right sort of a photograph will succeed, just as the right sort of a man will succeed; you may theorize all you please, but these are facts.

Nothing can resist the mental attitude, for all conditions are the reflex of our own minds. Everything is possible, life holds no impossibilities, and nature never gets disheartened and shirks her duty or grows tired of a task; no matter how much internal energy it takes to keep the old world whirling, nature keeps right on sawing wood.

It is the eternal kicker against the inevitable who is continually in hot water. His advertising does not pay because he has employed the cheapest means and put it out through the cheapest mediums. His illustrations are poor because his shortsightedness will not permit him to pay a fair price for a fair piece of work.

Just get your camera out and show him what

he needs; take his advertisements as they appear in print and make pictures that will excel them, give a suggestion or two here and there for a catch-word, or add a little legend to the picture and he'll buy it; not perhaps at first, but keep at him until he becomes aware that you really mean business. By and by he will realize that, while he may know his business better than you could ever hope to, you can at least suggest the illustration for his advertisement that will help to sell the goods in a far better manner than he could do it himself.

If he is a manufacturer of steam
engines or shoes or cigars, or is a
brewer, or a retail merchant, it is
all the same. If he has made a
success of his business, he has had to work hard to get it there; working early and late, he has studied all its phases and mastered all its details. To do this, he has had to give his business his best thoughts—his best efforts day in and day out. He has not had time to find out much about the other man's business. Every day he has learned something about his business he did not know the day before, which has added to his fund of knowledge and experience.

He has never given much thought to the illustration of his advertising. Why should he? It is an entirely separate line and would take his time and attention from the more vital interests. What is true of his business is also true of the photographer's business and of every other man's business.

While he has been learning to make steam

**The
Advertiser's
Limitations**

engines or shoes or cigars, the advertising agent and the photographer have been studying along the lines of their particular business; and if they add their knowledge to his, the resultant advertising is stronger, more valuable and surer of success than if either one attempted to work it out alone. And so the advertiser is dependent on both the agent and the photographer to provide the pictures and arguments which will appeal to the public as a bid for patronage, if he hopes to place his advertisements in the front and with them hold the public's attention.

This fact is so well understood
The Advertising Department now that some of the leading concerns have established their own advertising departments, which are run by competent men under whom outside workers in the artistic and photographic field are continually working out pictures suggested for illustrating the advertisements that are changed from month to month. These departments usually have a few men who can be depended upon to work out certain ideas, but they are generally conducted along broad lines and do not confine themselves to any one set of photographers. Such concerns or corporations are always in a liberal mood, and the photographic suggestion that appeals to them as admirably adapted to their line of goods will meet with a welcome reception and fair compensation.

Advertising Agencies Concerns who advertise and have no separate advertising department, generally call upon some good and reliable advertising agency. These employ men

especially trained along advertising lines, who are in touch with modern methods and ideas, in getting up the best form of advertising matter for the particular line of goods which the advertiser wishes to place before the public.

Many advertisers do not even call upon any one agency, but rather the agencies call upon them, fall upon their necks and rejoice that another outlet has been created through which the good dollars can pour into the advertising mediums and channels—for the average advertising agency is an avaricious beast and devours everything that comes within its reach.

The advertising agencies are as thick all over the country as flies around a molasses barrel, and they rank from the highest down to the individual plodder, who sails in the seventh heaven of glory, mentally, but who can hardly word an advertisement for a country newspaper.

Of course, photography is used from the highest class of magazine advertisement all along the line down to the obscure little cut tucked away in the corner of some page, that, for lack of space, is hardly ever seen unless looked for. And this is the one thing the reader will not do,—look for an advertisement. The advertisement must look for the reader, come upon him suddenly, and with such force of beauty or strength as to rivet and hold his attention until he has taken in at a glance the import of the printed page. This can hardly be done without the aid of pictorial matter; and a glance through the current magazines will show that photography plays an important part in attracting attention to the advertisement. . . .

**How
Photographs
are Used**

Every large magazine has, on an average, at least a hundred examples of straight photography among its advertising pages each month, and in combination with wash-drawings, pen work and crayon or charcoal sketches, there are many beautiful specimens of really artistic photography.

A great deal of this matter is prepared under the supervision of the art departments connected with the magazines and the advertising agencies, but, as very few of the agencies employ photographers steadily, they are compelled to draw on the outside worker whether he be specialist or professional or amateur.

Many of the beautiful wash-drawings used in this way are worked up on the lines of the amateur's small photograph; and the results are often most satisfactory, but in doing so there is sometimes very little left by which the photographer can distinguish his work beyond the actual figures that were the chief attraction of the picture.

In order to adapt the photograph to the goods advertised, the location, background and objects in the original picture have all been removed and the figures apparently have been changed to an entirely new locality, while often the figures themselves may have to be rearranged and given a different position in the final print from which the block is made. Among the illustrations will be found many examples showing how the photograph is adapted for different sorts of specialties.

And Why

Through the discoveries and inventions of Ives and Meisenbach, and the subsequent development of the half-tone

process until the present day, the photograph has reached universal popularity as the best original from which the half-tone process plate can be made, so that it is now possible to secure a reproduction of the original so close in general effect and detail as to puzzle the average reader to distinguish it from a photograph, especially if two or more printings are made from carefully prepared process plates. All this renders the good photograph a much-sought-after medium for illustration, and, as the cost of a good photograph is less than quarter of the expense required to work up a fairly good wash-drawing, it is easy to see how naturally the photograph supersedes the drawing for almost every form of pictorial advertising.

For the illustration of books, magazine stories of every sort, booklets, catalogues, announcements of schools or lecture-courses, calendars, periodical advertising, and, in fact, all forms of advertising matter, whether printed in black and white or elaborated in many colors by means of lithography, photographic illustration is strong and effective in the almost unlimited scope it offers. In other words, original and artistic expression of ideas is as possible by this means as it is with brush or pen in the hands of the artist.

One of the great difficulties in
Subjects: the work is the securing of suitable
a Difficulty models, possessing at once pictorial possibilities and aptness for the particular purpose in view. As a matter of course, the "eternal feminine" provides the greater part of the subjects used in pictorial advertising. But the reader

must not be misled into believing that the only way to success in the work is to secure attractive pictures of girlhood or womanhood more or less connected with the use of things advertised. Old age and childhood, as our illustrations suggest, will often provide advertising pictures which will appeal to manufacturers. In the selling of men's shoes, hats, etc., the illustration of these articles obviously calls for the male model. Similarly, photography has many uses in advertising wherein the human interest plays no part, as one may see in the advertisement pages of *Country Life in America* and magazines of that class. But this leads us into the specialist or purely commercial branches of the work with which we are not primarily concerned in these pages. To go back, then, to the use of women, children and men in the illustration of advertisements, we must look for models combining symmetrical form with a pleasing amount of beauty or personal attractiveness, expressive features, ease of carriage and that general distinctiveness of pose or manner which will arrest and hold the public eye.

Color is
Deceptive In the use of women and children as models, local color is often deceptive. The harmonies of coloring, for instance, which we observe in the hair, eyes, flesh and costumes of the living model will sometimes turn out disappointing in the black and white print. If this can be controlled by a suitable "make-up" or the choice of special draperies, the difficulty may be in some measure overcome. For this reason, the experienced worker will not always enter into the expense of producing or

trying to produce a picture, or a series of them, from one model until he has first made some minor photographic studies under varying condition and lightings, so that the new model can be tested and proven worthy of the time and materials to be used, plus a fair possibility of a fair return on the results.

**Where
Personality is
Undesirable** To make exposure after exposure and spend no end of time getting around the result desired, is about the easiest thing to do with the camera; but to get at it after two or three preliminary attempts, and bring the result to the plate requires the quick perception, keen insight and tactful management of the amateur. Personality must not enter into the question. He must handle his subject as the sculptor does the clay in molding his ideas from the inanimate mass. The model, the draperies, and the paraphernalia are, after all, but the brushes, paints and canvas—so to speak; the picture itself is the creation of the artist, as the attractive photographic picture is the creation of the artist photographer.

The highest aim of the photographer, whether professional or amateur, should be to merge the real with the ideal in such proportions as will lift the picture above the commonplace; and to produce pictures for illustration or advertising which will stand out from pages of reading matter as the vital points that give emphasis, suggest, invite, attract, and finally please the reader. To embody these features and to crystallize all this and more into an illustration: that is art—the art of photography in illustrating and advertising.

Figure 1
Frontispiece

In Fig. 1 (the frontispiece), a specimen of straight photographic work as applied to magazine advertising is shown, and in this picture the qualities described are clearly emphasized. First, the subject is good, then the pose is easy; there is nothing to suggest that the subject is posing for the camera or an artist. The girl is eating candy and enjoying it, and her expression and gestures convey to the observer that fact without any wording below to explain the meaning of the picture. It also creates a desire on the reader's part to do the same thing. This is the aim of the picture, namely, to gently lead the reader's gaze to the printed matter that may appear below, setting forth the kind of candy she is eating with such evident pleasure, the man who makes it and where it can be had, together with other more or less important information.

This is the sort of candy picture that catches the eye: the girl first, next the act, then the reason for the act, and, lastly, the man or concern offering the goods advertised and where they can be found.

Certainly there is no other branch of advertising that offers a broader scope for originality and for the creative faculty than this department, and surely none where these elements are more vital.

What to Seek The aim of the photographer should be to produce pictures that are characteristic, strong and vigorous, as well as artistic. They should possess individuality of their own, so that, when worked into advertising matter, both the illustration and text will harmonize

and yet both stand out boldly from the page, inviting you to look and read.

All advertising has its own peculiar problems and conditions to be dealt with and worked out in detail; but these are not a part of the photographer's work. In the laying out of the space to obtain the most attractive results, and to give to the advertiser the largest advantage for his outlay, the advertising agent and the typographer are chiefly involved. Advertising agents are always open to suggestion, however, and along some lines they will pay liberally for ideas or even rough suggestions which can be worked up into attractive advertisements. Twenty-five and even fifty dollars have been paid by the agencies responsible for the advertising of certain well-known soaps, washing-powders and special lines of cosmetics and drugs. In this corner of the field the amateur photographer may find many profitable openings for ideas or pictures obtainable at little cost either of money or time which may prove valuable to manufacturers of goods continually advertised.

One's own originality is often more to the point than the suggestion of another improperly or imperfectly worked up, and the chance photograph is in most cases more "catchy" and full of feeling than the carefully planned and laboriously studied effect, which often has a wooden appearance and a lack of realism.

The posed effect in a picture is

Avoid
"Posing" at once tiresome and repulsive to the average reader, unless the face of the subject appeals so strongly that it overrides

the deficiencies in the picture. To sell such "posey" photographs is quite a difficult matter, save perhaps to an inexperienced advertiser or a new agent in the field who is too sure of his ability to "place it" and fails, to his own disappointment and loss.

Things Which Misperlead The photograph of your best girl or your sister may appeal to you as being most charming and beautifully adapted to certain lines of display advertising, but after it has been rejected by two or three agencies and an advertiser or two perhaps you will pause, begin to analyze the situation, and finally conclude there was too much personality thrown into the deal, and by comparison with other photographs that have been published along the same line, the rejected print lacks some essential points and is, in fact, flat and uninteresting save to yourself and immediate family.

This is the pitfall that snares many good plates and hundreds of good sheets of paper into ruin, from the commercial standpoint—personality, the subtle influence that is hard to elude and which drags many amateurs into the paths that are not successful from the viewpoint of profit and loss.

Work for a purpose, not for a personal gain, a smile or a favor. The advertising picture is a distinct product, not a photograph of the subject for the subject's sake, but quite apart from the model—as distant as if it were never to be shown, save to the purchaser. Professionally, this is the case with hundreds of photographs made for advertising purposes; the model does not see

the finished product until by chance, perhaps, it appears in the advertising pages of some magazine or attention is attracted to it by a friend.

The photographic illustrator could not be bothered to show models the result of every photograph, for they follow so rapidly in succession that one is soon forgotten in the run of new ones that are turned out continually; and then, too, the model is a superfluous being in a studio, except in time of necessity, and then she is needed sometimes quicker than she can be had in an emergency, where time is money, and a magazine's forms are being held for the "copy" and picture.

Take Time Rush work in pictorial advertising is always most disastrous, and quite clearly shows that the slapdash and half-worked-out ideas could have been improved upon if a little more time and pains had been taken.

Fortunately, this class of work is scarce, and is to be found only in the cheaper class of magazines. The art directors and magazine advertising managers are combining more strongly to exclude all forms of display advertising that are not in harmony with the good workmanship of the body of the book, and a strong censorship is exercised in many forms of advertising that appeared quite freely years ago, even in the best magazines.

Standards of Quality It is a pleasure to pick up the *Century*, *Scribner's*, *Harper's*, the *Ladies' Home Journal*, *McClure's*, and other periodicals of that class, and see the high standard taken by the publishers to bring the advertising illustrations up to those of the stories. So far has

this been pushed that we may find, here and there, display pictures far ahead of the story illustrations in artistic value, composition and general effectiveness. 'This shows the effect of competition among agents for advertisers' business, and brings out the fact that the best picture wins, and not the writing of the advertisements. The country is so full of "business literature men" that some of them have difficulty in securing clients, while the striking and original picture almost invariably finds a quick purchaser if intelligently placed before possible purchasers.

A quick sale is generally a satisfactory one, for it clears the track for a new run; not that the picture in question is not good. It may have been remarkably good; but it is a thing of the past, and the thing of the future is the inspiring factor. Then, again, a picture shown about too much becomes hackneyed, and it often requires more than a memory to keep track of the different firms to whom it has been submitted.

Other
Openings Independent of magazine advertising illustrations, there are hundreds of openings in the field for good photographs. Almost every city has at least one lithographing house, and in the larger cities they are plentiful. The art departments and salesmen of these establishments are always ready to submit something new to their customers, and for which, if accepted, a generous amount is usually given. The small print is often paid for as liberally as the large and carefully worked out photograph made by the professional, for the size is not always the attractive feature in the picture.

Apart from lithography, show-cards, hangers, posters, railway and trolley-car placards abound with pictorial features, most of which are worked up from photographs, while in many instances the small picture is enlarged directly to the desired size without modification, and printed from half-tone plates in black or in a combination of colors.

It would be as disastrous for a concern or manufacturer to employ one man continually to originate and work up the ever-changing features of the advertising matter required, as it would be for an artist or photographer to employ the same model or set of models from which to create the pictures which he hoped to sell broadcast to every good advertiser.

The work would soon begin to show duplication of ideas, for no one man's brain is fertile enough to produce new and original ideas forever without getting into a rut, and particularly when he works with the same model whose mannerism and facial expression is limited.

New faces, new ideas and new situations are the motives that attract new observers, and this is the oft-repeated song of the advertiser: "Show us something new."

The amateur, with his wealth of varying ideas and opportunities of subject and incident, will often secure a more gratifying result than the professional who works in the studio, from the so-called professional model. The latter usually lacks the freshness, the pretty costumes and the composure of the average amateur model because she makes a living at it

and follows the same vocation day after day. She is perhaps too poor to have the costumes, and the repetition of sittings becomes a drudgery rather than a pleasure, as it is to the novice for the first few pictures.

The model who understands how to do what she is posing for is, of course, the one who yields the best results ; but even then any self-consciousness in the pose will often spoil an otherwise good effect and produce an uninteresting picture.

There are few ideas, however, that one cannot work out successfully after a little patience and perseverance, and whether it be a candy advertisement or a stove-polish announcement, some thought or action will bring inspiration for a picture after a little study.

In illustrations Nos. 2 and 3 we have ideas that can be improved upon, but they suggest the use of soap and almost invite you to come and use it too. Similar suggestions likely to interest manufacturers of other household specialties will come to mind after a little thinking. The workings of the human mind, however, are enigmatical, and the picture that does not appeal to one man will please another, so that in producing pictures that seem to you to be good, don't throw up your hands at the first rebuff; try another probable buyer and still another until they have thoroughly convinced you that you are on the wrong track. Then start off on another track and do something entirely different; go at the proposition from the other side and think up something new. A change of viewpoint may bring inspiration.

**Advertisers
in a Rut**

Five years ago every corset manufacturer was in the same rut; they were all showing photographs of pretty girls harnessed up in the various kinds of corsets that each respective manufacturer produced. The ridiculous monstrosities that some concerns permitted to be published were absurd; they showed the head and shoulders of a beautiful girl set upon the bust of a four-hundred-pound fat woman with a wasp-like waist and the hips of a girl of fourteen. There was nothing real about it but the head and shoulders, borrowed from some girl who was willing to have her face displaced in this manner for a price. To pick up any woman's magazine and open it was but to come upon pages of these pictures, each one trying to outdo the other. But things are changing for the better.

Some manufacturer with artistic sensibilities saw the light and surprised his competitors by showing a beautifully gowned young woman in walking costume, and set forth the information that the fit of the gown was due to the X Y Z corsets, which, of course, he manufactured. What was the result? That concern doubled its mail-order sales the second month and is still improving in business and advertising, because that kind of advertising pays.

The wording did not do it; it was the photograph. A photograph full of the life, expression and atmosphere that made it genuine, and the women readers grasped that fact the moment they saw it.

No woman, except the most fickle, would care

to have the abnormal shape of the first illustration, but every woman would like to make the appearance and create the impression that was made on her by the photographic illustration. This fact is slowly dawning on other manufacturers, but the majority are yet displaying the female figure with the strapped, gusseted, gored and stitched, tightly fitting garment laid on it with the fashion plate artist's touch of the brush; and probably will, until the photographer produces a picture, and the agent an argument, that will set them thinking along new lines.

It is difficult sometimes to know where and how to begin to photograph for the advertising picture, and it is quite as difficult for any one to suggest. The accidental shot will sometimes hit the bull's-eye where the carefully planned shot will fly out far from the mark. Perhaps a casual remark, or the sight of something pleasing, will offer a clue to a scheme that can be worked out successfully, or an old thought dug up and revised will open the door to the secret.

 An attractive young lady was
Figures playing billiards at the house one
4 and 5 evening, and a pose so pretty and
full of action was taken in her enthusiasm over the game, that she involuntarily suggested a picture for a manufacturer of the popular small billiard-tables that are sold for use in the home. A few experimental pictures taken the day following were so successful that they made a hit with an agent and resulted in a good sale to a manufacturer.

Illustration No. 4 was the result of the work,

and illustration No. 5 shows how it was put in shape for the advertisement. The man in the background helped the situation, and the carefully worked in details of the board, cue and balls added to the comprehensive features that signalized the product. The girl was the single feature of attraction, and that clearly shows the photographic feeling, but to the experienced eye the man is painted in.

**Figures
6 and 7**

An old man came into the studio one day and asked for ten cents to ride home. Not knowing him or caring to let the act be a precedent for future calls, I offered him the coin if he would sit down at a table and hold a spoon in the act of eating.

A towel for a tablecloth, an old fork for a spoon, and a bowl daubed over with paint were the properties at hand. The occasion did not require obtaining anything better. I had no idea in mind at the time other than of the natural act of eating, so half a dozen plates were exposed and forgotten for a while, as the work was not ordered. The old fellow went off, happy with the small change, and in the course of time the plates were developed and a print of the best one tacked up on the wall.

Within a few days, a customer in looking around the room spied the print of the old fellow eating soup, and his apparent enjoyment of the meal touched a common chord of sympathy, for the man was a manufacturer of soups, jellies and food products; and one of his dummy-cans had been placed near the paint-bowl.

His line of advertising had been of the old-

time quality,—photographs of bottles and cans or wash-drawings of jam and preserves in crocks; but he had not attempted anything along pictorial lines. The print appealed to him so forcibly that he negotiated for it, and also some more along the same line, at ten dollars each.

Ten cents to ten dollars was quite a jump, and, taking out the cost of plates, paper and time, it left eight dollars profit on the deal. This is the occasional coincidence, however, and perhaps unusual, but it clearly illustrated the possibilities that arise and how they work out oftentimes. Illustration No. 6 was the original print, and illustration No. 7 shows what a little artistic work and lettering did to make it ready for the advertising pages of the magazines.

**Figures
8 and 9**

Illustration No. 8 is the studied photographic result for a soup advertisement. After a pencil suggestion had been given to the advertiser and following a little careful planning, the cut shown in Fig. 9 was ready for the magazine page. In the first illustration, notice that the figure is posed against a dark ground, but in the finished work the background is light. The advertiser objected to the dark ground and seemed to think the figure did not stand out boldly enough. He was right, and in this it is clearly shown that two heads are better than one.

The negative was stopped out with Strauss Marl, as shown in Fig. 8a (any other opaque will answer as well) and the positive was enlarged on a sheet of bromide paper, leaving plenty of margin all around the picture.

This was mounted on a sheet of Whatman's board and the design drawn in as shown; while, to modify the strong contrast between the black



FIG. 8a

hair and the white background, some light crayon shading was thrown behind the figure, softening it into the background and producing a delicate gradation of tones which blend extremes together nicely.

**Children
as Models**

Pretty children are strong attractions in many lines of advertising. Almost everybody will stop to look at the picture of an interesting child, no matter what its nationality. If you get them interested in the product you think out an idea for and let the action show the desire on the child's part to use the product as a child would, it combines the picture more closely with the goods. Rough ideas, like the one shown in Fig. 10, convey the meaning; and the advertiser or agent can see at a glance its significance as applied to his product.

Illustration No. 11 reproduces a striking advertisement used in the magazines some months ago. In the original photograph the child was seated on a box with her little arms clasped around two bottles of developer. The idea of a shelf and jam-pots was an afterthought, but it worked out admirably and caused a great deal of favorable comment. If the child's attitude and the composition had not been good, together with an attractive face, the picture would have fallen flat, but without the afterthought and in its crude state to begin with, it was a winner; its conception made it so.

Of course there are many conditions that help in securing attractive pictures of children. Their moods are so changeable and so noticeable in their little faces, that a great deal of tact and perseverance must be exercised to get a pleasing result. The best are the instantaneous shots that are made when the child is off guard or when the little model's mind is busy with other things than the camera. Genuineness in the act you wish

them to portray is the desired feature, and not the affectation they will be sure to show if they are made conscious of the effort to photograph them just so. It is more difficult to get results with children than with older models, but if you gain their confidence the task is easier, and you may count on several good plates in a dozen.

Figures 12 and 13 A friend of mine picked up a shoe that I was photographing in the studio one day, and the manner in which he held it suggested an idea. "Just hold that position a moment, old man," I said, "until I get a plate ready." The happy chance, Fig. 12, was worth ten dollars to me, while a good cigar and the fun of seeing his face in print was compensation enough for him. It happened to be a Regal shoe, and the Regal people used the print for an advertisement. It was worked up as shown in Fig. 13, but some type matter told a little more about the good qualities of the shoe, and where it could be purchased.

These chance shots will often prove successful simply because of their spontaneity and the lack of studied effect.

Figures 14 and 15 The two models shown in Fig. 14 had finished posing for a dramatic situation in a story illustrated by photography, where the young man had caught the girl and passionately kissed her. They were both actors and infused into the action a masterful amount of realism without meaning it. The picture was a complete success, and the action so well dramatized that I retreated to the dark-room to change plates and make another try, but on

coming out I found them grouped as in Fig. 14, gleefully devouring the contents of a small box of candy.

I straightway photographed them in the act, and sold the print as a candy advertisement, but when it appeared in print it was in the form of Fig. 15, in connection with an invitation to drink a certain kind of soda water. This shows the adaptability of a photograph to another product not thought of by the photographer at the time the picture was made.

When an advertiser has an idea to be carried out and no questions asked, it is always wise to follow instructions. It is much easier to do this

than to take chances. Fig. 16 is an example of this kind, and Fig. 17 is the result of combining the photo-

graph with a wash-drawing to get the desired result. The effect of combination photography is shown in illustration No. 18, where the lady of the house is putting out a fire in her parlor. The figure was photographed separately and overpasted on a bromide enlargement of a suitable room interior made to the required size. The fire and the stream from the nozzle were painted in, and the whole picture reduced to a half-tone cut. The effect is very realistic and pleased the advertiser.

This is merely an example of this sort of work, and it would hardly pay to follow up such ideas for special apparatus or specialties, unless an order were given for something in that line. It involves too much work for a small possibility of gain, and if rejected by one or two manufacturers of extinguishers, that ends it; whereas candy, soap,

perfumery, tea, jewelry, or eatable product pictures, if good, will always find a market.

The Use of Drapery The value of drapery in advertising photography cannot be overestimated, and quite frequently a very good idea is spoiled by a poor effect in the draping. Ideal heads and figures demand a careful study in drapery, and it is quite as much due to that medium as to the pose that a beautiful effect is obtained. The face in the picture is the life of it, around which the photographer builds up his scheme,—beauty, simplicity, life and action are the incentives; but often the best artistic efforts have to be sacrificed to the demands of business, and the operator must limit himself to certain old-time laws.

Drapery in some pictures would be as superfluous as three tails on a cat, and yet the over-draped picture is dished up and handed out to the public every day. The artist-photographer will deftly draw a small sash of veiling here and there across a shoulder or bust, or to hide a portion of the figure in a modest and beautiful manner; but the so-called “art photographer” will wind yards and yards of cheese-cloth about a charmingly pretty subject and hammer out a result that reminds one of an Egyptian mummy in the Metropolitan Museum of Art.

The Art of It As the artist and the photographer draw nearer together, the latter will begin to learn from the former some things he professed to know already, but in which he will find he was sadly lacking.

The photographer may have the subjects, but

if he lacks the refinement born in the artist no amount of bungling arrangement can be compared to the light touch here and there given the drapery by the artist which produces really artistic effects. The artist, with his pencil or brushes, works from the tangible before him, and anything lacking or deficient is drawn in or idealized; but the photographer is working with the elusive and intangible elements of line, color and light, and to obtain perfect results he must be master of the draperies. All questions of light, lenses, time of exposure and theorizing as to results are an after-consideration, until the idea becomes a carefully planned picture and satisfactory to record on the photographic plate. Then, and not until then, does he become conscious that a process is necessary to catch and hold this inspiration which is not a photographic record nor an accidental snap-shot, but a picture with an idea so clearly brought out at times that to add words would be a superfluity—it tells its own story.

It takes time and study to produce the beautifully draped picture; and in commercial photography its uses are limited, nor are they called for so frequently as in artistic photography. The oriental composition for some cigarette scheme will give one all the desired scope for drapery effects; but for the candy, soap, or bread-making pictures it is quite out of place.

Judgment must be exercised in the selection of draperies for certain pictures, just as the question of the right model and the appropriate background must be decided. Drapery, however simple

**Figures
19 and 20**

it may be, gives an artistic touch to a photograph that cannot be obtained in any other manner, but its proper use is an art, as well as a studied accomplishment. Its quality and not its cost is the point to be considered. After a few trials the expensive silk or satin will frequently be discarded for the inexpensive cheese-cloth, silkaline and thin filmy goods that cling and harmonize with the modeling of the figure. A few examples of draped head studies and a figure are shown in Figs. 19 and 20.

Cheese-cloth of the cheapest and thinnest quality beautified the shoulder and bust effect in Fig. 19, while in Fig. 20 a few yards of nine-cent light-colored silkaline gave the soft, beautiful effect of silk. This quite clearly illustrates the impression that drapery creates, and were it not for the simple arrangement of the thin goods just as shown on the two examples, much of the beauty and charm would have been lost.

**Figures
22 and 23**

Illustration No. 22 is the photograph of an interesting head sold to a lithographer for a good sum, and Fig. 23 is the reproduction in black of the same photograph after it had been printed in eight colors. The beauty is lost to a certain extent by not being reproduced here in colors, but the idea is shown and the manner in which it was reworked is quite clearly depicted in the black and white reproduction.

**Figures
24 and 25**

Magazine and booklet covers open another field for pretty ideas in photography, and Figs. 24 and 25 show the adaptation of a beautiful head study to a mosaic cover design.

The negative was stopped out with opaque outside the dark circle, so that the outside border paper or background would print white as shown



in Fig. 24a. The negative was then clamped in a large frame between heavy glass and the back board, and a platinum print was made of sufficient size to permit the mosaic design to be painted in around the head. The use of similar subjects for posters, book and booklet covers, suggests itself and affords a wide range of opportunity.

**Choice
of Ideas** The field of photography in advertising is so broad that it becomes almost limitless. The possibilities are so great and so diversified that to attempt to give any limited outline of the work would be futile. The ideas that appeal to one person, as adapted to advertising a certain article, would be quite different from those of another. Thus the picture that might seem just the right thing for a candy advertisement would in all probability, be quite the reverse of another person's ideas, but equally well adapted to the particular use.

In casting about for ideas, one will often grope in the dark for something imaginary and mythical, and which is so far beyond the tangible as to become prohibitive.

The theorist and the impressionist can glory in this field, but, to become comprehensive to the masses, one must get down to brass tacks and shoe-strings, so to speak, and produce with the camera those phases of life that are interesting to the majority of readers, doing it in such an inviting and entertaining manner as will lift the picture above the commonplace.

**Possible
Subjects** When the advertising pages of a modern magazine are turned over, it becomes apparent to the reader what a vast field advertising opens to the multitude of manufacturers who have goods and preparations for the people to buy. Each one seems to produce a different article, and yet what a horde there are of them. One man makes clocks, another gas stoves, the third a face-powder, while the

fourth, fifth and sixth, and so on, go on through the myriad productions of soap, underclothing, hair tonics, patent medicines, cologne, telescopes, toothpicks and pen-wipers, gum-drops and cod-liver oil, shoe-blackening, ice-cream freezers, sponges, brass beds and copper-bottomed kettles, fly-paper, toilet-powder, chocolate and floor varnish, pianos, feet for stockings, cook-books, pickles and fifty-nine varieties of other eatables, not mentioned but suggested. Added to this will follow displays of cut glass, fine china, silverware, linen, nursing-bottles, patent foods, deviled ham, free trips for guessing contests, pneumatic bust forms, bicycle tires, tooth-brushes, dress-shields and watches. Also a goodly array of massage cream, hair switches, cameras, washing-powders, double-seated pants for boys, and baked beans with tomato sauce for the whole family.

Of course each of these and thousands more, the list of which would fill a bigger book than this to the exclusion of any other information, all open up suggestions for developments along the pictorial line, and each manufacturer who advertises will recognize the pictures best adapted to his needs.

Of the many pictures shown to the readers of magazines, those with pretty women and children always seem to be favorites, and, to get these, just think of the vast number that must have been rejected! For it is not one out of ten that is the lucky number. The others are relegated to the shelves, drawers or waste-basket of the photographer, to be brought out perhaps at some later date and reworked for another scheme.

Law for Advertisers

Just a few words, in closing, about the law relating to photographers of individuals or groups, sold for display advertising, publication or public distribution.

In September, 1903, a law was passed making it an offense to publish, display for business purposes or sell a photograph of a person or persons without their full written consent and permission. This was the result of many cases of misunderstanding and disregard for the rights and wishes of individuals by those into whose hands photographs available for publication fell.

There have been many lawsuits and deplorable oversights, as well as permissions taken for granted in relation to the publication and sale of portraits and artistic poses. Hence the law was framed and the bill passed, settling the question once and for all.

This law is very strong and cannot be gotten around, so that, when making photographs for possible publication or sale for advertising, be sure to get the full written consent of the subject before disposing of the photographs, and never take it for granted that you can get it any time you may want it.

Do not take chances with any one's picture, whether you made it or not, for the ownership of the negative carries no rights for its disposition for commercial gain; and, before negotiating with an advertiser, always get your signed receipt and permission under date, and, if possible to do so at the time, write on the receipt the use to which the picture is to be put.

**A Formal
Receipt**

This is easily done in the following manner, and the photographers who make a business of this work have their printed forms more or less elaborately worded, but this form will stand.

NEW YORK, *July 10, 1904.*

Received from John Doe, one dollar for services as model in the production of photographs for publication. To which I hereby release all claims, rights and titles.

Amount \$1.00

(Signed) MARY DOE.

A simple printed form which I have used for several years is here reproduced.

*Head Studio
and "ad" photos*

RECEIVED FROM

JOSEPH H. ADAMS
BIBLE HOUSE
NEW YORK

Five no/100 *\$5.00*

IN FULL FOR ALL SERVICES AND RIGHTS TO PHOTOGRAPHS

DATE *July 10th 1904* SIGNED *John Doe*

Always get a duplicate receipt for the advertiser you sell the picture to, and keep one on file, so you can refer to it if necessary. This will obviate any possible misunderstanding at a future time, for people forget what they said or agreed to verbally a year or two ago; or perhaps some unscrupulous person may try to blackmail you, and difficulties will arise if you have not the written proof of your statement to show your rights in the case.

Perhaps you would never have anything of this kind occur, but it is always well to safeguard your work. A lithographic, advertising or printing concern will demand the release of the photograph for publication before they purchase it, so it is just as well to get this document of evidence and concession at the time the picture or pictures are made; for people change their minds sometimes and may refuse to sign a release at the latter date, when the photograph in question has been sold and is to be used.

A model who was well known among the studios a few years ago in New York cut off her best photographic connections in a very short time by playing two sides. She received the money for her services and, when her pictures appeared, demanded money from the publishers or advertisers, claiming that she did not know her pictures were to be published, when in reality she posed for the especial subject that was shown in the finished result. This is a mild form of blackmail or duplicity, and is soon the destruction of a model's value to any artist or photographer.

A young lady well known to several of the best artists in New York posed for a variety of advertising photographs, and at the same time some ideal head studies were made and subsequently sold in the art stores. The gentleman to whom she later became engaged was displeased by the display of the pictures and wrote demanding the sale stopped, using the argument that the young lady's permission covered advertising pictures only. As her services were sold for

a price and she posed expressly for the photographs and understood they were for advertising, it made no difference whether they were published in magazines or disposed of in the art stores. A letter from my lawyer adjusted the matter. Beyond these few disturbances, I have had no trouble with the hundreds of photographs made from models and disposed of for advertising and publication purposes.

The Value of the Receipt If the receipts had not been in hand it might have been difficult to convince the court of my rights when the cases were brought to issue; but I had the strong point in my favor of always paying out money or pictures for services, and not receiving any from models or others, as I did not make a business of portraiture for the public.

These examples are merely given to put the amateur on his guard against a possible misstep in case anything unpleasant should arise in connection with photographs made for advertising; but in all probability he will not encounter any trouble if a proper receipt is in hand.

Photographs Unfit for Publication A word of warning may be useful concerning the fitness or otherwise of certain pictures for publication purposes. There is a tendency on the part of some advertisers to use semi-nude or scantily draped figures as a means of calling attention to their announcements in the public prints. This tendency is vicious and well deserves the condemnation given to it by all right-thinking people. The amateur who seeks success or profit in advertisement illustration will wisely avoid

work of this sort. The prominent magazines, as also all reputable advertising agencies and advertisers, are scrupulously careful in passing any photograph for publication which is in any sense suggestive or undesirable. To submit such photographs not only spells failure but also creates a prejudice in the mind of the advertiser which will probably prove fatal in future attempts to win his interest. As to what is unfit for publication purposes, the following definition by the art editor of the New York *Tribune*, Mr. S. H. Horgan, is probably as reasonable as anything yet said on the subject and offers a safe guide to all who have to do with the illustration of advertising matter, regardless of its form or the method of publicity followed. I quote: *Photographs of human beings in costumes or poses in which they would not appear in public are liable to be unfit for publication in an ordinary newspaper.*

JOSEPH H. ADAMS.

Notes and Comment

Mr. S. H. Horgan estimates that 10,000 photographers, artists and engravers are at the present time finding employment in the single department of newspaper illustration in this country.

His own experience in the field of illustrated journalism has been continuous since 1874, when he was connected with the *Daily Graphic*. He dates the era of modern newspaper illustrations from the appearance of eighteen pictures, by V. Gribayedoff, on the front page of the *New York World*, dated Sunday, February 3, 1884. In the present Sunday issues of that paper, nearly half the space is occupied by illustrations of text or advertising matter.



We are asked by the publisher of *Wilson's Photographic Magazine*, New York, to state that subscriptions to that magazine should be sent direct to the office of the publication at 289 Fourth avenue, or paid through recognized stock dealers only, no other agents being employed or recognized. This announcement has been made necessary by the fact that many subscribers have been duped by persons fraudulently representing themselves to be agents for the magazine in different parts of the country.



The Infallible Exposure Meter Company, 237b South Fourth street, Brooklyn, informs us that the demand for Wynne's Infallible Shutter Speed Tester, recently introduced on the English market, has been so great that the manufacturers are behind with their orders. A large shipment will arrive in this country shortly, when the company hopes to be able to supply all orders promptly. The estimated speed at which the average shutter works is very largely a matter of guess-work, and this accounts for many failures in negative-making. With the Infallible Shutter Speed Tester, one can find out in a few minutes the exact speeds at which any shutter works, and this would be found

to be a decided help in making accurate exposures. The Infallible Tester sells at \$1.50, and should save its cost in a day's work with the camera.



Photographers' Association of California. The first year of the life of this Association shows that the membership has increased steadily month by month, and the Association is now in a flourishing condition, both as regards its financial affairs and personal following. The outcome of the year's work shows remarkable activity, and the Association now holds a very honorable place among the photographic organizations of this country. We congratulate our friends on the Pacific coast upon the existence and well-being of their Association.



The Mobile Register (Ala.) has fallen into line by inaugurating a thoroughly good and interesting photographic corner under the heading "Lens and Camera." The department is edited by an old friend of THE PHOTO-MINIATURE, Mr. Richard Hines, Jr., and should strengthen interest in photography throughout the South.



The uncertain composition of commercial sodium carbonate is well known and is often responsible for failures in negative-making. It has been ascertained that the average commercial sample of sodium carbonate contains from 37 to 60 per cent of the salt more or less unclean and impure. The recrystallized sodium carrying water, in prime condition, contains 37 per cent of the salt and 63 per cent of water, but this water gradually dries out, so that the strength of the sample quickly deteriorates. Chemically pure anhydrous sodium carbonate is $2\frac{1}{2}$ times stronger than crystallized, but by exposure to the air this will absorb fully 10 per cent of water within a short time. To meet the demand for an absolutely guaranteed salt, Burke & James have recently introduced chemically pure dried sodium carbonate. This is exactly double the strength of the crystallized form and is guaranteed not to absorb moisture or dry out, but to retain its strength uniformly. Only one-half of the usual quantity called for in a formula specifying sodium carbonate crystals should be used when the Burke & James product is employed. It can only be obtained in sealed glass bottles bearing the manufacturer's trade-mark. A similar product

is the Burke & James anhydrous sodium sulphite, which is guaranteed to be just twice as strong as pure sodium sulphite crystals.



In its issue of June 10 the *British Journal of Photography* celebrated its fiftieth birthday by the publication of a Special Jubilee Number of 128 pages, containing a number of unusually interesting papers illustrated with portraits of prominent photographic workers. Taken all in all, this Jubilee Number is the best we have seen of the 2,301 issues published by the "B J" during its fifty years, and students of photography should not miss it. We congratulate our venerable contemporary on its long and successful career, and wish it *ad multos annos*.



The new catalogue of the Century Camera Company, Rochester, N. Y., tells a story of remarkable progress in camera construction and is as good a hand-book to the modern hand-camera as we can recall. All the new Century styles and improvements are shown in detail, with admirable illustrations showing their advantages. Among special features we note that the reversible back is superseded by a revolving back; a mirror panel is introduced showing the focusing screen image right side up; a focusing screen that is always in register; and a triple extension-bed operated by a single pinion movement. The mere mention of these things should cause every reader to send for a Century Catalogue, and, when this is done, a mention of this magazine will directly help us in our work.



A classified List of Books on Photography, embracing all the books in print, has just been issued by Tennant & Ward, 287 Fourth Avenue, New York. Copies can be obtained on request.



It is no news to those who are at all conversant with the actual speeds of photographic shutters of the patterns ordinarily in use, that the figures so prettily stamped on the black or nickled indexes are a delusion and a snare. A moment's reflection should show that it would be out of the question to furnish, at the prices asked for them, instruments of the precision indicated by these fractional markings.

Recent investigations by Dr. H. Lehmann, of Munich,

on half-a-dozen patterns—one of which is well known in this country—showed wide variations from the scale and from one another. For instance, instead of $\frac{1}{250}$ of a second, the true exposure was $\frac{1}{74}$; $\frac{1}{100}$ was $\frac{1}{49}$; $\frac{1}{25}$ was $\frac{1}{9}$; $\frac{1}{6}$ was $\frac{1}{4}$; $\frac{1}{2}$ was $\frac{1}{6}$; and $\frac{1}{1}$ was $\frac{1}{6}$. Not only were the quick exposures, by the index, less rapid in reality, but the supposedly longer ones were quicker. Of course, the actual time is not of great importance, so that one secures sufficient exposure, but the experience suggests an explanation of some failures in timing, as well as the desirability of a test by each user of the real capacity of his own apparatus.



It must be very hard to suit the photographer, be he professional or amateur, who cannot find some mount to his liking in the 1904 catalogue of Taprell, Loomis & Co., of 418 Dearborn street, Chicago. The illustrations,—which must be commended,—show to great advantage the fifty or more attractive styles offered for choice; not the bare mount, but each with a suitable subject, showing the *ensemble* effect. It would seem that their claim, of helping to make money for photographers, must be a perfectly just one.



We note the suggestion of a writer in a recent English contemporary that musical compositions, such as some of Mendelssohn's "Songs without Words," invited pictorial interpretation, for instance, by photography. It recalls to mind the explanation of the French *fin de siècle* critic of his methods: "I always write of pictures in terms of music—and of music in terms of pictures"; and makes one pray for the grace to enjoy each kind of beauty unalloyed.



The power of a cleverly written advertisement as a means of increasing the demand for a product already well and favorably known is demonstrated in the announcements of the Hammer Dry Plate Company, St. Louis, now appearing in our advertising pages. As all who have used them know, Hammer plates have always been thoroughly good plates, equal to the best in the market and responding to every requirement of the amateur and professional worker. But for years the advertisements of the Hammer plate were dreariness itself, and the plate won its way solely upon its

merits. Some months ago a change was made in the advertising policy of its manufacturers, and the Hammer announcements are now full of information, crisply written and varied from month to month. As a natural result, the factory reports a largely increased demand for Hammer plates, the output taxing the utmost capacity of the plant. The Hammer plate needs only an introduction to show its quality.



The Buffalo (N. Y.) Camera Club is awakening from its long sleep and proposes an exhibition, which is to be limited to the work of the members and to the showing of gaslight prints only. This club has recently taken a novel census of its membership, using the following form, which we commend to other camera club officials as likely to bring them desirable information: Name? Address? Kind of cameras used (size, etc.)? Kind of lens (number)? Kind of shutter? Do you use plates or films? What make do you prefer? What developer mostly used? What printing process? Is there any process you would like to try? Have you a dark-room? How long have you been an amateur? Are you deeply interested in photography? If not, why not? What class of work do you prefer,—landscape, marine, portraiture, genre, still life, etc.? Do you attend the meetings regularly? If not, how can we make them more interesting to you? Are you having difficulties in your photographic work? What are they? What suggestions can you make to benefit the club? Remarks: Fill in anything not covered by the above.



At a recent meeting of the Edinburgh Photographic Society, Mr. Baldwin Brown, who occupies the chair of Fine Arts in Edinburgh University, gave an illustrated lecture upon "Composition and Light and Shade in Turner's *Liber Studiorum*." Doubtless, those who have pored over this remarkable collection of prints will be glad to peruse the following abstract of the lecture as affording a key to the many wonderful things in this wonderful volume.

Professor Brown began by explaining the reasons which led to the selection of the subject for the evening's paper. He had tried to find a theme which, without being photographic, would yet have some bearing on the artistic side of the work done by members of the society. When visiting the Photographic Salon in London during the summer, he had asked himself the question: What were the qualities in

which the artistic photograph differed from the ordinary print? and he found that these qualities depended to a considerable extent on manipulation of light and shade. In the artistic photograph the lights and shadows were brought into harmonious relations, and an effect of unity was secured; whereas, in the ordinary print, taken just as the subject happened to come, the lights and shades were all over the place, and there was no harmony. No artist had ever been a greater master in composition in light and shade than the great English landscape painter Turner, and in none of Turner's productions was this excellence so marked as in the series of plates known as the *Liber Studiorum*. Hence the selection of the subject as one bearing on practical photographic work.

An account was then given of the origin and history of the *Liber Studiorum*, and of its relation to the so-called *Liber Veritatis*, or *Book of Truth*, of the seventeenth century landscapist Claude. Claude's drawings were little more than memoranda of his pictures, and he probably called the collection the *Book of Truth* merely because it contained an accurate record of his various completed pictures; but Turner, who, apart from his art, was a somewhat confused thinker, seems to have imagined that Claude intended to represent in his drawings the whole truth of nature in her various aspects. Turner accordingly girded himself to the task of producing a series of plates which should surpass in the representation of natural truth all that Claude had accomplished. The task was easy enough, for, in the first place, Turner's knowledge of nature in all her myriad aspects was infinitely greater than the knowledge possessed by Claude; and, in the second place, while Claude's drawings, which had been reproduced in slight mezzotints by Richard Earlom, were mere sketches, Turner aimed at producing more elaborate and finished landscape studies, and invoked for aid on the copper plates the best available talent among the engravers of his day.

The technical character of the *Liber Studiorum* was then explained, and it was shown that Turner used a combination of etched line with mezzotint for the light and shade. Some of the etched plates before any light and shade was added were shown on the screen, and it was pointed out how masterly was Turner's use of line in order to convey the truth of the skeleton or structure of natural objects. His mountain drawing in the etching called "Ben Arthur," and his tree drawing in "Near Blair Athole," were especially noticed. In the slides of a number of the completed *Liber Studiorum* plates, which were then thrown on the screen, at-

tention was primarily directed to questions of composition and light and shade, and Turner's constant use of repetition as a means of securing unity and repose was illustrated in many examples. The masterly representation of natural truth in the forms of water and clouds and trees was also illustrated, and the variety of the aspects of nature presented in the work as a whole insisted on. It was evidently Turner's main intention in the work to display nature in all her moods, and this was the reason why he was always so anxious that the work should be looked at as a whole. Reasons were given for dissenting from Ruskin's view that Turner intended in the *Liber* to preach any sermon on the passing away and failure of human achievement, and it was found, as the plates were passed in review, that some of the most beautiful were those in which there was nothing but pure artistic composition, without any pronounced meaning or intention of an intellectual kind. Plates of this kind, such as "Hindoo Ablutions," "Hindoo Devotions," and "The Bridge in the Middle Distance" were among the most successful in the whole collection.



Many are the vagaries of makers of pictures in the naming thereof—painters as well as photographers—and doubtless always will be, *sæcula sæculorum*. It is the habit of the artist to rig up his model in armor, let us say, and name the picture he paints therefrom "Richard Cœur de Lion"; while in another costume he becomes—the same patient model—"A Venetian Gondolier." Along these lines, attention may be called to an article by Will Cadby, in *The Amateur Photographer*, entitled "Types." In it he urges the desirability of seeking out—and finding—"Characters" that do not have to act the part. There are excellent illustrations, testifying to Mr. Cadby's success in the practice of his own preaching.



The Steadman System of Exposure.—This system is based on the fact that every exposure is nothing more than a certain length of time with a certain diaphragm.

The length of time may be fixed by the "solio time" of the light at the brightest or objective part of the subject, and the diaphragm may be varied to recompense for the color and class of subject and for the speed of the emulsion.

The fixing of the time by the measurement of the light

with solio paper, or by ascertaining what may be termed the "solio time" of the light at the brightest part of the subject as before mentioned, expresses by a simple numeral all those factors which appear in the modern exposure tables, and fully covers the complications of latitude from the equator, season of the year, and hour of the day; while, in addition to these factors, it solves in a few seconds the truth of intensity under local conditions of weather and at very early and late hours of the day; which latter elements the exposure tables are confessedly inadequate to deal with, by reason of the entire unstability of nature under those circumstances.

The method solves the problem of exposure with artificial light in a definite manner, as, on taking the solio time of any such light at a certain close distance, the solio time at the distance of any subject may easily be determined.

Theoretically, the length of time that is required to bring the solio paper to a just plainly observable tint, when held at the position of the brightest part of the subject and turned at right angles to the principal source of light (the tint to be examined by raising the shield under which, through a small hole, the paper is to be tinted and looking at it in comparison with the original color of the untinted paper), is the "solio time" or the intensity numeral which expresses the intrinsic intensity of the light where the solio paper was held.

Practically, however, on account of the very great latitude of all photographic emulsions, it is unnecessary to make that solio time any other than one of the following simple scale of time intervals:— $\frac{1}{8}$ second (the solio time created by the tropical sun at the noon hour and also at that hour in the temperate zone, as the sun must be only 30 degrees from the horizon on a clear day to reduce the intensity of its illumination to $\frac{1}{8}$ of a second of solio time), $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 4, 8, 16, 32, 64 (or 1 minute) 2, 4, 8, and 16 minutes, etc.

Suppose that in taking a portrait it was found that the solio time was exactly six seconds. Either four or eight seconds would be correct, but one might be more desirable than the other, as the lesser would make the half-tones of the photograph assume a lower position in the tone scale than would the greater. At this point it becomes possible and convenient for the advanced worker to bring into exercise, not only his greater knowledge of photography, but his requirements as determined by his individual taste as to the exact results that he is working to obtain. The beginner, however, could make no mistake by giving either four

or eight seconds of exposure under the circumstances mentioned. I have allowed in the method that the worker may take the lesser time with safety, as the normal exposure is fixed rather at the point of "endurance" than at the point of minimum exposure.

Taking the "solio time," then, as it has been explained as a basic exposure, the following example will illustrate the simplicity of the system: Suppose that I have a certain emulsion (plate or film) in hand and wish to photograph a person of average complexion. I place the subject under the light and, on taking the "solio time" at the position of his forehead, I find it to be four seconds. Taking four seconds as the basic exposure, I give a number of exposures of that length with different diaphragms in the lens, and on developing the exposures I find that the one made with diaphragm 16 (U. S. or f) has the full normal exposure. I have found, then, that the "solio time" of the light is the exposure with diaphragm 16. Now it makes no difference whatever what the "solio time" may happen to be on some other occasion or nearer to or farther from the light.

Here is seen the benefit of thinking of the light in simple numerals. It makes no difference as to the intensity of the light; the *solio time of it will always be correct when photographing such a subject with the same plate or film.*

If, late in the day, the solio time should drop to sixty-four seconds the "solio time" of the light (now sixty-four seconds) would still be correct with diaphragm 16. In using that emulsion, then, it is possible to print on a card this subject and its diaphragm in the following manner

Subject Table and Solio Diaphragms.

(Corrected for ? ? ? Plates.)

<i>Portrait—</i>	Diaphragm
	U. S. f/
Average complexion	16 16

Now, suppose that a person of very light complexion is to be photographed. In order to retain the "solio time" (four seconds) as the exposure, it is evident that I must alter the exposure by making the diaphragm smaller. So by experiment I find that the four-second exposure is normal with diaphragm U. S. 32. In the same manner it is found that with a person of very dark complexion the proper diaphragm is number 8.

Now suppose that it is desired to photograph a snow view of the bird's-eye-view type, and that on measuring the light it is found to be four seconds in intensity. (This

would of course be at a rather late hour in the day or during locally dark weather.)

It is evident that this kind of a subject cannot have as much exposure as a portrait, since it is of a very light color and practically void of actinic contrast. Any exposure that will allow it to impress itself upon the emulsion will render all the detail of footprints or outline of grass or distant trees that may be in the field, and it is therefore unnecessary to give a full exposure to get detail. On the contrary, it becomes necessary to give what is known as a minimum exposure, in order that the few intermediate values that exist may be carried down in the tone scale as rapidly as possible in order to create a *drawing*, or a differentiation of opacity planes in your negative.

On making several exposures, therefore, with different diaphragms (each being of four seconds or the "solio time" in duration), and developing them in the same standard developer under standard conditions, the one made with diaphragm 256 U. S. turns out to be the one that is the most satisfactory.

By further trial it is found that if there be objects in the middle distance the diaphragm which gives the best negative is number 128, and if there are objects in the foreground, assuming some considerable proportional size in the field, then the diaphragm which best does the work is number 64.

In like manner all the ordinary subjects met with in nature are tried and, with Eastman film, which I have used in all my work, their solio diaphragms are found to be those placed opposite each in the following table:—

<i>Portraits—</i>	Diaphragm.	
	U. S.	<i>f</i> / <i>t</i>
Very light complexion	32	22
Average complexion	16	16
Very dark	8	11
<i>Room Interiors—</i>		
White walls	64	32
Average walls	32	22
Very dark walls	16	16
Dark machinery	8	11
<i>Regular Exteriors—</i>		
Bird's-eye class	128	45
White objects in middle distance .	128	45
Average colored objects in middle distance	64	32

<i>Regular Exteriors, continued—</i>	Diaphragm	
	U. S.	<i>f</i> / <i>l</i>
White objects in foreground . . .	64	32
Average objects in foreground . . .	32	22
Green trees abounding	32	22

Marines and Snow Views—

Bird's-eye class	256	64
Objects in middle distance	128	45
Objects in foreground	64	32

Buildings—

White	128	45
Average color	64	32
Very dark, as red brick, etc. . . .	32	22

Now, returning to the first experiment: Suppose that the emulsion that I was using had been one-half as fast as the Eastman film. The experiment would have shown that the correct exposure would have been the one made with diaphragm number 8 U. S. instead of that made with 16, and the only difference between the table for Eastman film and that for the other slower emulsion would be in the placing of one larger diaphragm throughout the whole table.

Now suppose that in every roll of film and box of plates this simple table could be found as a part of the directions for working them. In that case, any worker, whether experienced or merely a beginner, could open any box of plates or films made in any part of the world and, although he may never have heard of the make before and regardless of the particular speed which that factory manufactured, he could proceed to take the solio time at the subject and select the solio diaphragm of that subject and the *former would be the exposure with the latter*.

If it be required to make the exposure with some other diaphragm, it would only be necessary to halve the solio time for each diaphragm opened, or double it for each one closed beyond the solio diaphragm given in the table.

The plate and film manufacturers would, therefore, do their part in this work and test each emulsion that is used, or at least each formula, taking the greatest possible care to make them uniform from time to time, and print this table with the correct diaphragm and enclose one in each package of their goods. We would at a stroke have the whole problem of exposure solved in the most simple and effectual manner. At the same time, the worker who wishes to do more than simply expose normally may exercise his judg-

ment with greater knowledge of the effects that he is to obtain in doing so.

This table will tell the worker the most important thing about the goods in hand, i. e., the exposure necessary, as a bad exposure can be developed with no developer, while a normal exposure may be developed with any normal developer. The directions for developing each kind of plate or film, therefore, could much more logically be omitted than this table, which would fix the speed of the emulsion.

It is the business of the developer manufacturers to give us the correct formulas for their products, varied, if they consider it necessary, for any particular brand of plate or film; but it is the business of the plate and film manufacturers, *primarily*, to give us a simple guide of this character to indicate the necessary diaphragm to use with the intensity of the light as a fixed exposure.

Not to give this information was perhaps excusable when only professional workers used the goods under certain known conditions, but in these days when amateurs are numbered into the millions and the children are active in camera work, it is extremely unbusinesslike for any manufacturer to longer delay in placing it along with their products for the guidance of whoever shall happen to open and use the goods.

The absolute novice loses fully 90 per cent of his exposures because he knows nothing of the light and cannot expose correctly. If this percentage could be reduced to from 1 to 5, every worker would have ten friends that would be induced to take up photography, because they would see that it was no longer a matter of blind guesswork.

This is the field that the manufacturers are missing by allowing amateurs to lose, and really uselessly waste, such a large percentage of the products that they have made with such painstaking care.

Notwithstanding the great amount of photographic work that is being done daily, it is probably true that nine-tenths of all cameras are today "on the shelf." If some such simple and absolutely reliable system as this should be organized and placed in action, a majority of these cameras would without doubt be brought again into use.

The schools are taking up the practice of photography, and would do so much more actively if there was an absolute system of knowing to be relied upon.

The automatic shutter-maker also has his part to do. The speeds given by their instruments should harmonize with the scale of "solio time" given.

In the first place, the intervals of $\frac{1}{4}$, $\frac{1}{2}$ and 1 second, etc.,

can be given perfectly in practice by the worker himself, and without the aid of any *automatic* device. The word "quar—ter" gives a quarter of a second, the phrase "naught—one—half" gives a half second, and "naught—one—half—and—one" gives a second. The following lingo may be used to count any desired number of seconds:

Naught — one — half — and — one
 one — half — and — two
 one — half — and — three, etc.

The correct speed may be obtained by looking at the second-hand of a watch or listening to a clock that ticks in quarter-seconds.

If the shutter has a "B" release with which the blades open when the bulb is pressed and closed when released, then an eighth of a second may also be given by hand. This is done by placing the shutter at the "B" position and pressing the bulb about as fast as it can be done. If the shutter is not an "ever-set" type, the bulb may be pressed twice while saying or thinking the word "quar—ter." The blades closing as the hand is released *exactly between the two pressures* gives an exposure of $\frac{1}{8}$ of a second with great exactness.

With such a shutter,—having a "B" release, then it is not necessary to have an automatic interval of speed slower than $\frac{1}{16}$ of a second, and the series of speeds should increase in rapidity as follows: $\frac{1}{8}$, $\frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$, $\frac{1}{256}$, etc., of a second.

Suppose that on photographing an ordinary exterior with average objects in the middle distance the intensity of the light is found to be $\frac{1}{2}$ second. The solio diaphragm of that subject is seen in the table to be U. S. 64 and the exposure is then $\frac{1}{2}$ second with diaphragm 64. The exposures with each of the larger diaphragms are seen in the following table:

Exposure with diaphragm 64	$\frac{1}{2}$
Exposure with diaphragm 32	$\frac{1}{4}$
Exposure with diaphragm 16	$\frac{1}{8}$
Exposure with diaphragm 8	$\frac{1}{16}$
Exposure with diaphragm 4	$\frac{1}{32}$
Exposure with diaphragm 2	$\frac{1}{64}$
Exposure with diaphragm 1	$\frac{1}{128}$

Now to be able to give any one of these required exposures by simply turning the speed-pointer to the required interval is an advantage too evident to require discussion.

Several of the prominent shutter factories are looking favorably upon this scheme, and recognize it as the only practical speeding for automatic shutters. I believe that

this plan in shutters would enable the present unreliable system of valves or "plunger" to be done away with, and a system of simple springs substituted which would work with much greater accuracy as well as with greater speed.

Every photographic society should petition the plate and film manufacturers to adopt this plan. They can do so without feeling that they are doing a financial favor to its author, as no attempt has been made to protect it by copyright or patent.



*Some Characteristics of Our Pictorial School.**—One of the chief temptations which assail a pictorialist in our day is the temptation to make a display of boldness and technical bravura if the real things are not at his command—to work in a rough and careless and pretentious way, which, with untrained eyes, may pass for the freedom and rigor and breadth of a master-hand.

In pictorial photography, a mode of graphic expression where freedom of handling should be especially prized, and where from the strictly interpretative nature of its methods, the public may find it difficult at times to distinguish between the subtlety of tonal values (of a C. H. White or Edmund Stirling, for instance) and a meaningless fuzzy-type, it was to be feared that our young pictorialists might fall into sins of a careless or pretentious sort. But such has not been the case. When they do sin, it is usually in the way of too much timidity, too little personality and force of handling, too much useless elaboration, too little abstraction and condensation and insistence upon the vital structure of their subject. They do not always conquer the possibilities of their art in the way of directness, strength and originality, but neither do they travesty its leading qualities. Sincere devotees of pictorialism like H. G. French, of Cincinnati, for instance, who have begun soberly and conscientiously, are therefore more likely to work their way to complete mastery than if they had begun in careless overconfidence or wilful posturing.

Another fact which has struck me most favorably is that, as a rule, our men show a very just instinct in the use of their media. There is scarcely an effect of any sort which has not been successfully handled by one pictorialist or another. But it is nevertheless true with their technique as with that of any other art,—that certain forms of expres-

*This note was inadvertently omitted from our last number. It refers to the examples of pictorial photography accompanying that issue.—EDITOR.

sion are by nature best adapted to its use. If it is a pictorialist's obvious intention to make his picture look like an oil painting, the critic may well protest. True enough, in rare cases the work produced may possess such high artistic qualities that the medium becomes a consideration of secondary importance. In that case, the artist rises above his technique and his method is quite legitimate on esthetic grounds, but how often does it occur!

In the choice of subjects, the pictorialists seem less fortunate. They devote themselves almost entirely to tonal schemes, neglecting strength and directness of expression. Tonal values are their strongholds; and a certain blurred quality their principal virtue. They seem to have chosen Charles Blanc's remark about etching, as their motto. He claims that etching should be attracted most by everything that is irregular, bizarre, incomplete, unexpected and disordered. With these requirements our pictorialists seem to be in perfect unison.

It is a distinct relief to mind and spirit to meet with work which defies the usual prompt way of summing up. Mrs. J. E. Bennett, of Baltimore, is a photographer of uncommon ability, and of the most graceful and elegant taste. She affects a poetical quality which is rare, and she attains it in a delightfully simple manner. W. F. James, of Chicago, on the other hand, is following a line of work which cannot be too highly praised. He has chosen local themes for his display. While our art is still so young and so rapidly developing, it cannot be too often said that one of the principal hopes for its future must lie in the willingness of our camera workers to interpret the life which surrounds them, and to which their spirit must be most akin. It is fortunate, indeed, that a few men like James see the value of these things, fortunate for themselves as well as for the repute of their profession, since every art worker does his best when most at home with his subject matter, and there is no such spur to originality of expression as freshness of material. We cannot easily be parrots of some smart Alick, who thinks he knows it all, if we are saying things that none has said before.—SADAKICHI HARTMANN.

Books and Prints

MUELLER, HUGO.—Das Arbeiten mit Rollfilmen (Working with Roll Films). Pp. 64, $5\frac{3}{4} \times 8\frac{3}{4}$ in.; 47 cuts in text. 1903. Halle, W. Knapp, M 1.50.

The changes in photographic methods brought about by the introduction of films as a substitute for plates are compared to those following the substitution of dry-plates for the wet-collodion process. But that was years ago, and the comparison has no force for the "camera fiends" of today, who reckon not at all of the good old days, before photographic work had been lightened into play, at least so far as portability and compactness of apparatus are concerned. Nowadays it is nothing for our enterprising dealers in this city to receive in their morning's mail a roll of films from the Soudan or Alaska, for development, and the return of prints. That is truly "long distance" photography.

This work is for those who are beginning with the use of films, and treats of lenses, shutters, cameras, etc., as well as the various manipulations and devices necessary or convenient in developing, fixing and drying films. While utilizing other sources of information, to which he gives credit, the author has based his recommendations on his personal experience and observation.



SALCHER, DR. P.—Die Wasser, Spiegelbilder (Water Reflection Pictures). Pp. vi + 38; $5\frac{3}{4} \times 8\frac{3}{4}$ in.; 8 diagrams in text, 12 plates. 1903. Halle, W. Knapp. Paper covers, M. 1.50.

The author of this little essay, a professor in the Marine Academy at Fiume, on the Adriatic coast of Austria, has been moved to a consideration of its somewhat out-of-the-way subject, by his observation of the false effects often apparent in the rendering of the reflections in photographs of marine and other views. That these usually pass unnoticed he admits, charging the ignorance of the public and of the photographer with equal shares of responsibility for this state of things.

Accordingly, he develops, by means of diagrams and a

consideration of the optical laws of reflection, the theory of the matter as applicable to reflections from a plane surface like still water, and from a wave-broken surface, like the same body of water ruffled by breezes or lashed by storm.

This theory is then applicable to other surfaces which act mirror-wise, such as the wet asphalt of a city street, polished wood, metal or glass, and similar objects. From the artistic standpoint, he rightly considers mere reflection pictures, say in still water, as more interesting than they are beautiful, but insists on the importance of the shadows of objects photographed directly against the light in giving "values" to the result.

The illustrations are mainly subjects in which the picturesque fishing-boats of the locality, with their triangular sails, are shown.



The Meyrowitz Photographic Library, comprising current and standard periodicals and books, is advertised by a circular which comes from E. B. Meyrowitz, the well-known New York optician.

The regular price is refunded when any book is returned, thus making a free reference library available to the patrons of any one of the three New York stores of the firm.



We are advised by the English publishers that the following books are out of print and no definite information is obtainable with regard to new editions.

Photographic Painting, Bool; *Pictorial Effect in Photography*, H. P. Robinson; *The Use of the Hand-Camera*, Clive Holland; *Photogravure*, Denison; *Photo-Engraving*, Farquhar; *Bichromate Salts in Photography*, Abney, Wilkinson and others; *A B C of Retouching*, Young; *Photography with Emulsions*, Abney; *Practical Enlarging*, Hodges. Among new books and new editions received are *The Half-Tone Process*, by Verfasser, revised and rewritten, new price \$2.50; *Bichromate Salts in Negative-Making*, by F. W. Edwards, price 25 cents; *Photography by Rule*, by Sterry, price 50 cents; *Selection of Subject in Picture-Making*, by Tyndall, price \$1.75.



We have already made mention of the publication of *The Real Dickens Land*, by Mr. and Mrs. H. Snowden Ward (London, Chapman & Hall, Ltd.; Philadelphia, J. B. Lip-

pincott Co.). A careful glance through the volume tells us that our earlier word of welcome to the book was well merited. In its text and the pictures which embellish almost every one of its 240 pages, the book gives us more of the personality of Dickens and of the haunts of his famous characters than any other volume within our knowledge. We are impressed by the quality of the photographic work, due, we believe, to the skill of Mrs. Ward. And the text, although necessarily descriptive, is brightly written and sustains one's interest from the beginning to the end of the volume. A capital index and directory to the land of Charles Dickens, occupying ten pages at the end of the volume, are worthy of special mention because of the great amount of information they give, lending to the greater enjoyment of the book and its pictures. Nor must we forget a word of praise for the photogravures inserted here and there, which give special attraction to the volume. It is interesting to note that the steel-engraved portrait of Charles Dickens which forms the frontispiece of *The Real Dickens Land* is from a photograph made in America.



With all the popular interest in photography evinced by numerous references in current magazines and other journals, there is still much haziness in the minds—or the pens—of those who write the articles in question. Here is the staid *Century* crediting Henry Meade with the authorship of the Daguerre portrait (admirably reproduced in the May issue) instead of his brother, Mr. Charles R. Meade. And the *Independent* of April 23d, in alluding to the uses of photography in the Government offices, for copying documents, etc., states that a “comprehensive index of the negatives is to be made, so that one of a required document can speedily be developed when needed.” Evidently a slip for “printed from,” but still rather unexpected in this connection.



EMERY, M. H. *Le Procédé à la Gomme Bichromatée* (The Gum-Bichromate Process). Pp. 32, 5½ x 7½. Paris, Ch. Mendel. 1904. Paper, 60 cents.

Le Développement Automatique à deux cuvettes (Automatic Development with Two Baths). Pp. 32; 5½ x 7½. Paris, Ch. Mendel. 1904. Paper, 60 cents.

These two brochures are reprints, in a convenient form, from the columns of the *Photo Revue*.

A recent number of *McClure's Magazine* contains some very successful examples of photography applied to illustration, the work of Clarence H. White. It may be that the camerist will develop into a serious rival of the wielder of pen and brush in this field, thanks to the progress in process work, and to the serious attention increasingly bestowed on the details of costuming and posing by the adepts.



STOLZE, DR. F. *Optik für Photographen* (Optics for Photographers). Pp. xii + 172; $5\frac{3}{4} \times 8\frac{1}{2}$; 107 illustrations; paper. Halle, W. Knapp. 1904.

This thoroughgoing treatise covers the subject, as it presents itself to photographic investigators, omitting general considerations or applications along any other than the selected line. The nature of light, its propagation and intensity, refraction, diffraction, with its color-effects, interference, take up about half the book, the remainder being devoted to theoretical and practical considerations on the photographic objective. This includes a very systematic and fully illustrated account of the recent types of German and other lenses, with details of the optical formulæ and particulars of the angular aperture, focal length and plate-covering qualities.



“SCRUTATOR.” *Photographic Failures—Prevention and Cure*. Pp. 94; $4\frac{3}{4} \times 7\frac{1}{4}$ in.; London. 1904. New York, Tennant & Ward. Paper, 50 cents.

The trite saying that “it is the unexpected that happens” is nowhere truer than when applied to the practice of photography. In the beginning, the enthusiastic votary, with the impression still strong upon him from the perusal of seductive advertisements of apparatus by the use of which “any one can take photographs,” expects successful results. Of course, results of any sort are in one sense successful, but one soon becomes more critical and begins to hunt for the reasons of un-success.

Here are assembled, in orderly array, the possible—and highly probable—devilments that are to blame. The various shortcomings of negatives are treated in six chapters, each with the preventive, mitigating or reparative treatment which is called for, fully gone into. Other four chapters treat of positive printing processes, and a final chapter is devoted to lantern-slides and enlargements. The book may be commended as “good for what ails you”—photographically.

WALTER KILBEY. *Hand Camera Photography*. Pp. 124; 4 $\frac{3}{4}$ x 7 $\frac{1}{2}$; London. 1904. New York, Tennant & Ward. Paper, 50 cents.

This little work aims to teach the first things of photography to those who take it up with the wish to find recreation and possible aid in their various activities, through the readily portable and unobtrusive hand-camera rather than the tripod form. There are chapters on the Selection of a Hand-camera, Accessories, the Lens and Lens Facts, the Dark-Room and its Equipment, the Hand-camera in the Hand, and on the Stand, Developing Plates and Films, Remedying Defective Negatives, etc., Printing and Toning of Printing-Out Papers and other printing processes, Enlargements and Lantern-slides. The methods and information given are of a very practical sort, and the illustrations of the author's work show that he knows and has mastered his subject thoroughly. Aside from the slight drawback of a few terms that require translation from English into American usage, a matter of no great difficulty, the work is one which may profitably be adopted by workers on this side.



The Practical Photographer: American Library Series. Edited by F. C. Lambert and Thomas Harrison Cummings. Monthly, 25 cents. Photo Era Publishing Co., Boston. This series of handbooks is the American edition of *The Practical Photographer*, London, England, mentioned in these pages some months ago. The number noticed deals with "Titles, Mounts, Trimming, Frames and Gilding," forming a very useful guide to the amateur in the finishing of his prints. The illustrations show various styles of mounting and framing. A separate section is devoted to the pictorial work of Mr. Alexander Keighley, an English pictorialist of note.



KLARY, C. *La Pose et L'Éclairage en Photographie dans les Ateliers et les Appartements* (Posing and Lighting in Studios and Home Photography). Pp. 78; 8 x 11 in.; 40 plates and illustrations in text; Paris, C. Klary. 1904. Paper, \$2.50.

This sumptuous brochure has been issued, M. Klary informs us in his preface, with the purpose of "showing the path which should be followed to obtain truly artistic results in photography." For text, he has translated No. 2 of THE PHOTO-MINIATURE, Inglis on *Artistic Lighting* and Todd on

Home Portraiture, all American works, adding a revised version of an earlier work of his own on a kindred subject. These are accompanied by half-tone plates, comprising about seventy-five subjects in all, of the work of nearly forty European and American professionals. While these subjects are, on the average, of more than ordinary interest and are finely printed in toned inks on highly coated paper, they are of miscellaneous character, which renders the educational value of the volume, as a whole, somewhat problematic, though it is certainly attractive to the eye. We wish all success to its veteran photographer and publisher.



PETIT, JR., PIERRE. *La Photographie Simplifiée et la Lumière Artificielle* (Simplified Photography and Artificial Lighting). 5 x 7 in.; pp. 75; cuts and diagrams in text. Paris, Gauthier Villars et Cie. 1903. 2 fr.

There is little reference to the first subject, beyond the general statement that "modern photography dates from 1883." The second part proves to be a description of the Bernhorft system of flashlight, as applied to professional and amateur use in portraiture. Many of the hints on posing and lighting are of real value.



RIS-PAQUOT. *La Préparation des Plaques au Gelatino-bromure par l'amateur Lui-Même*. (Platemaking for Amateurs). Pp. xii + 71; 5 x 7 in. 1903. Paris. Gauthier Villars et Cie. 2 fr.

This seems a late day for such a work; like a reversion to the principles of "every man his own shoemaker." The author claims consideration for the practice on the score of economy; but the usual amateur, if he sets any value greater than 10 cents per hour on his time, will find himself decidedly to the bad—all along his self-made plates. The details given by the author are complete, and he is a safe guide for those who want to travel that route.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

JULY, 1904

Number 64

Figure Composition

"The sweetest thing to man is man." When an artist takes mankind for his subject, he allies his art with what the poet declares is his "proper study." Nature and the beasts are unbidable, but the rational animal hears the command "do this," and he doeth it. That is, he thinks he does—and there's the rub. With all man's willingness to do as told, the willing is secondary to the thought, "What do I look like, the while?" Therefore the artist sighs and stretches forth his arms to unthinking nature and the unsuspecting beast. That unconscious demeanor either of a lonely peasant picking up potatoes, or of Diana midst her nymphs, unsuspecting of the gaze of Actæon,—this it is that contains the charm.

The difference between the use of the model by the painter and the photographer is at this point made manifest. To the one he appears as a suggestion, to the other he is the fact. The photographer, therefore, must be endowed with such distinguished gifts, or conversant with such clever devices, as will make the model forget himself.

When the subject does this, the real self is at the artist's command.

The Bugbear A short word, therefore, on such influences, hypnotic or otherwise, as give momentary possession to the artist of the consciousness of his model. Very gifted men may secure this result through conversation, but the gray matter of the average man does not stretch sufficiently to cover his manual effort, and, at the same time, to gild a tale above the suspicion of motive. Instead of this, therefore, a third person, who may engage the sitter and leave the maker of paintings or photographs free to work untrammelled and seize that second which proves "the fertile moment," is a luxury which photographers and painters find pays for itself.

The Fact of It Every one, with never so little experience, has discovered how little like himself a person may frequently look; or, rather, how infrequently like himself a person really looks. Why not save plates and patience and wait, with favoring conditions, for the subject to repeat himself? The far-away gaze with relaxed features which the portrait painter encounters is only a shade worse than the tightened grip of over-anxious expectancy which mocks the photographer.

The conversationalist, the reader, the maker of music—this one should be part of the equipment of the well-ordained portrait studio—the artist, the model and, what Frank Stockton would call, "the discourager of hesitancy."

Aware that pose and expression must co-exist, the one a concomitant of the other, the average

man prefers to take his chances when they are the nearest together, even at a sacrifice of his ideal, rather than to allow either to become cold and then expect a fusion.

Therefore, the snapping of the subject when hardly prepared, and when about to pose. This, in the case of the single figure, often proves good policy, producing either a point of procedure in motion, or a moment of arrested motion. Each contains life.

The sequence of the body to the mind is a point upon which the subtleties of a pose may be revealed. The expression discloses the will's command to the body, which later obeys it. Let the expression, therefore, precede the action. The eyes are awakened, the head turns upon its neck. This much is noted before the body has received the signal. It is because of the mental activity suggested in this sequent action that we like to observe the brain and head doing one thing, and the body preparing to catch up.

In the portrait of Whistler's mother, with its sentiment of absolute repose, the body and head are in the same line, without action; but in his portraits of women standing or moving, the head and body are almost always at differing angles.

Mr. Hubert Herkomer's full-sized study of an English workman he entitles "Ready to Pose." It depicts a man just risen from a chair with a query in his eyes: "Well, how do you want me to stand?" "Just so, without a change," was doubtless the command, and, four to one, it was given after striving for a half hour or so to make

**Body
and Mind**

the uncomfortable and abashed exotic forget himself amid artistic surroundings which he had never before beheld.

A shot on the wing was the only thing under such conditions—and under many another too.

But, with the group, these chance tactics will not do. There the unity of idea hangs upon concerted action, which, if lacking, results in a broken chain; but of this later.

Children As models, children are often preferable to adults, because of their unconsciousness. They willingly “take a pose,” and enter into their part of the drama with zest, if it be rightly presented, and think not of how they appear. When this admirable quality is discussed before them with an indiscretion which must seem like brazen effrontery to their unmasked senses, the loom is already set up, the web started, and the cloak will soon be ready for the disguises of life.

When Willie, seated among his toys, “is too cunning for any use,” Willie looks up, opens both ears and, as a model at least, straightway begins to prove that his mother is right. The supple postures of harvesters swinging, bending, gathering, are exchanged for the rigid front of a chain-gang under inspection in the presence of the camera; and the only recourse when a group is secured is that of Bodmer of Barbizon, who, as one of them, had the confidence of the peasants,—namely, to ejaculate in disgust that he had forgotten something, or that the sky was wrong, or that he was dissatisfied with the group and would try later. This assurance removed restraint, and,

in the arrangement which he had carefully planned, they resumed labor. The result frequently proved a close approach to what Millet himself produced with the same models.

The approach of the model is a study in itself, and deserves a separate brochure, for, with all an artist's knowledge of available forms of construction, if he cannot get his models into the chosen structure undamaged in the handling, his artistic intentions are as water poured on the ground.

THE SINGLE FIGURE

Man's attempts to include the single figure in a frame, to render a semblance pictorial, are among his earliest efforts in art, and he is still made anxious over the problem.

Three Ideas Given a personality, how best may it be converted into a picture? The personality, the line of it, the light and dark of it—three separate and complete notions to be welded into one; and, more than this, to be set into a frame. This last is a serious matter, and, because made light of, or never sensed at all by some, continues to give them trouble and frequently to baffle their best intentions.

One way out of the difficulty is to vignette the subject; but this is but a subterfuge, and any picture that cannot frankly approach its frame has no place in the category of serious art. More of the subtleties of art may be observable in handling this problem than in calling forth those qualities in the subject which are meant to be seen.

The most attractive and commanding line in art is the vertical. Compared with a horizontal of equal degree, the vertical would be our first choice. In this position, the figure occupies almost double the space it would if seated. These two reasons for representing our subject standing are met by one objection,—the two oblong spaces on either side of the figure.

The Cross Though less objectionable in the portraiture of women than of men, owing to the slight diagonal of the skirt from the hips, the vertical sides of frame and figure must always contain a problem, and its solution is a matter of cleverness based on a principle, namely, the principle of the cross structure.

When the vertical is tied laterally to the sides of the frame, the idea of unity is acknowledged, and those objectionable long spaces are divided.

In Plate I, the portrait of the artist Chase shows these spaces pierced, and the vertical lines of the body attached to the verticals of the picture's sides by the hand swinging with its brush, and the palette extended by the mahl stick. In the Roosevelt portrait, the cross is felt through the baluster-rail and newel-post, through the left elbow and into the shadow. In the picture of children and lanterns, these somewhat formal positions with their long cutting lines cease to appeal as lines and masses by the spotted attraction which diverts the attention in opposed directions.

The Rehan, one of the greatest successes of Mr. Sargent, shows the same lateral scheme as the Chase portrait, with the transverse line following

through the fan, and into the back line of the skirt.

Besides these devices for foiling the force of the vertical by linear opposition, the composer has recourse to a number of means for weakening, when desirable, the force of the vertical. In the Chase portrait (Plate I), the value of the background is in several places almost that of the contour. The idea of an outline, therefore, is lost, and the more important notion of mass—light mass—is enforced; the head, vest, hands and palette. In the Roosevelt, the vertical of the coat, besides being broken by the arm bent at the elbow, is also tempted by the shadow,—an arrangement which is effected in the Rehan with less assertion, where the vertical front line is in shadow merging into the cast shadow.

This is one of the clever touches which Correggio's art reveals and which that artist uniformly insisted upon—the juxtaposing of the shadow side with a shadow. The result is, of course, one of great softness and one productive of breadth, for, instead of a series of lines, we feel these linear forms and see the simplified effects of the chiaroscuro.

The force of the vertical may
Devices and further be weakened by diversion
Equivalents (Plate II) from it to something else,
as with the boy and dog. It may be opposed, as
in the "Crucifixion," and its force thus neutral-
ized. The lines of the mantle of "Lady Macbeth"
are a succession of verticals, but they present a
gradual scale from the center toward the sides, and
withal the lines of greater attraction are counter

lines, the arms and crown. The girl in black presents the same point noted with the Rehan portrait—the shadow side touching the cast shadow, instead of relieved against light.

Repetition of a line in other parts of a picture dissipates the force of such a line. Hence, in the upright portrait of the woman (Fig. 5), we have this relief in vertical lines of the background. Change of color along the contour of an object creates a lost-and-found line, and the sense of a contour encased in a frame is lost. This point is well shown in Fig. 6.

In the ten examples discussed is discernable an effort to lead away from the vertical with counter lines which may attach it either directly or indirectly to the sides. These examples are sufficient to establish a conviction that a vertical can never be used within four sides without the balancing influence of oppositional lines or spots.

The most painter-like of the means discussed is the first, that of obliteration, which is equivalent to sweeping the contour into the background and making the substance of the body a part of the tone which envelops it. Those who are familiar with Mr. Nicholson's Whistler, done in three tones, will appreciate the effort to depict him through the means which his own art exemplified.

But let us offset this with a portrait of Velasquez, in high relief, the only attachment being by means of the shadow bending the vertical at its base toward one of the sides. This brings our thought to the treatment of the figure through another of the fundamental forms soon to be considered.

Should the reader stop short of being convinced of the necessity of securing a cross in combination with his vertical figure, the recommendation is made to study all such presentations made by artists. It will be found that, wherever the oppositional tendency is weak, the structure is enfeebled, and it strengthens in degree as this is present.

In the artist's effort to accommodate his subject to his conditions, he has recourse to another of the fundamental forms of construction, the triangle. If a cross is neither desirable nor possible, the vertical sides may be pulled out at the bottom, affording a shape of physical stability in itself, and allowing the ends of the exterior lines to tie with the picture's sides.

The outer spaces thus left, instead of being rectangular, become triangular or irregular, and a relief on this account is experienced.

In Plate III, the fine decorative quality of this form commends itself at once. The absolute triangle (Fig. 1) between the arms becomes the key for the whole construction, its regularity of line yielding well to its dignity of expression, and, moreover, there is the necessary adhesion to the sides. As a pyramid (Fig. 2) in its line is more in character and the question of background has not a moment's thought for us. The "Girl with Apples" is another good space-filler, for the head has been kept well up toward the top line. With the spreading diagonals of the triangle, the vertical and horizontal lines fall easily into a good linear scheme (Fig. 3), and the use of both vertical and horizontal of curtain lines and chair

(Fig. 4), to fill a larger space of background than has been allowed in Figs. 1, 2 and 3, is easily appreciated. In the "Old Woman Knitting," the chair-back has more value in linear construction than the work-basket on the opposite side, as here the line of the body leads toward the side, which is not the case with the right arm.

The pyramidal form should be traced in the more extended compositions published herewith. The "Chess Players," by Roybet (Plate IV), develops its apex in the top of the what-not, and its sides through the figures and furniture, the spaces on either side carrying vertical diversions. In "The Dice Throwers," there are two pyramids, the single figure on the left and the group. With other examples attention has been called to this form and their analysis.

The Rectangle In his effort to unite his figure with the outer lines of the picture, the artist has still another form at his disposal, the rectangle, a hint of which is had in the portrait of "The Buffoon," by Velasquez (frontispiece). The rectangle of body plus shadow creates an opportunity for the body to unite with its sides, which, in Plate V, is expressed by the lines of the figure itself, or such an item as paper, palette or handkerchief connected therewith (Figs. 2, 4, 6). In the forms of linear construction discussed in *Pictorial Composition*, the writer explains that the form of the rectangle is the only one which is dependent, the other forms having in themselves the qualities necessary to balance. Some attraction within the angle is demanded, and in the degree in which these examples express this feeling

are they satisfactory. Fig. 1 discloses a photograph on the table, a dim spot merely, and this with its pull not only from the hand and head, but from the foreplane to the back plane, helps to settle the balance, the while interrupting the otherwise extended stretch of emptiness along the right side. In Fig. 2, the palm leaves are the items of balance within the angle. In Fig. 3, the eye naturally seeks the stretch of open space, but finds too little there to balance the weight of the child's body. Fig. 4 suffers as a portrait by the interference, not only of the background interest of the picture, but of the vertical of the canvas' edge. A suppression of these values would still have left ample attraction for balance. Had the face of the portrait upon the easel been restrained as a suggestion and the canvas graded in light downward toward the right corner, the attraction would have occurred in a line with the angle's center and in consequent balance of a better sort. The firm verticals of the curtain in even repetition (Fig 5) are the attraction within the angle, and effect their service of drawing the vision either down from the head or up from the hand, as the eye makes the circuit of the picture. Fig. 4 is destitute of the balance within the rectangle and in consequence presents a line cutting diagonally across the picture. The empty segment were as well cut off; indeed, if this were done and the space used for type, the picture would serve well as a sliced illustration.

The observations regarding the balance of the isolated measure within the angle call for two postulated statements which may be applied to

all cases of balance. "A small item of balance in the distance is equivalent to a larger one in the foreground," and "an isolated object near the edge of a picture has more attraction than the same object nearer the center."

In example of the first, note the small photograph (Fig. 1), or the larger item, the palm (Fig. 2).

On the second proposition, the head of the child (Fig. 3), and the hand and handkerchief in Figs. 5 and 6 are examples.

The unification of sides with subject suggests another form, namely, the letter S or Z. Either the grace of the one or the energy of the other effects the same requirements, a recognition of all divisions of the picture space. With either of these forms, there is less dependence for a result upon the background, the forms themselves being excellent space fillers. Many pictures from the realms of fancy in art come to one with this form in mind. "La Nuit," by Bouguereau, now in the Metropolitan Museum, in which the lines of the sinuous figure floating in space are further carried out by an owl and two distant birds, so that the line of this letter is almost perfectly delineated. Another excellent example is the "End of Day," by G. R. Barse, in which the smoke of a brazen lamp prolongs the upward sweeping line of the figure, while, below, the wind-blown drapery finishes the balance of the form.

As a line, the letter S is so complete, containing the gist of balance and the essence of grace, that the feeling among artists is, when possible, to let

it alone. To add to the picture other elements that may detract therefrom is either unnecessary, or unfortunate if necessary, and, beyond the space sufficient to accommodate the form, little is used. In the series of panels, "The Five Senses," by Makart, the serpentine movement of this line is well expressed. The impression of life and sinuous

**The Line
of Beauty**

grace is more easily felt in the nude than with the draped figure, but the convincing recommendation contained in the former can be applied in degree by experience and tact in the latter. Certain it is that the artist will not elsewhere find a better line with which to suggest movement whilst the model is in repose. It therefore contains that æsthetic quality of suggestion, and adds thereto such movement as Michael Angelo reminds us belongs to the tongue of flame which winds and curves and stretches upward; such movement and semblance of life, he says, being the greatest quality a figure may possess.

With this recommendation in mind, he who deals in the prosaic verities of the daily demand for portraits may lift his work a little out of the commonplace by applying the principle.

THE BACKGROUND

Were it possible to reduce to a scientific basis that which will ever continue to be æsthetic in its character, the amount of supporting space demanded by the subject proper could be known. Somewhere on the scale of either expansion or contraction, such space becomes absurd. It may,

therefore, be concluded that somewhere between the extremes lies the happiest point.

This is obviously that at which the background is least noticeable, as the main purpose of this is support. With this in mind, the artist must be the judge of the amount of domination of which his figure is capable, and not insist upon sovereignty of more territory than he can hold. In these days of space limitations for everything, the spirit of cutting and clipping has reached photography. It has attacked painting by limiting the size of the canvas; but the photograph must now be sliced, and with the same gleeful spirit with which the hostler docks a horse, or the sport clips the ears and tail of his dog, does the new photographer back up his print to the trimming-machine. And then, too, it must be framed close. I will not say that the experience to photography is not a profitable one. This search of the essence is beneficial, and must bear fruit, too, in the elimination of detail. In certain cases, few without doubt, the sliced animal is improved, and we know that the deed is one of consummate judgment, and say that the surgeon was an artist. He cut not only to save, but to improve.

And then the hack professional begins to slice, at two dollars per dozen.

Though there can be no arbitrary rules concerning art, it seems to me that, in nine cases out of ten, the clipping, to be successful, should be vertical and not horizontal.

Clipping To clip from below is akin to seeing our subject sink lower and lower in the surface of the water until there is nothing

but the Woodbury soap of it left. To clip from the side is as though our personality withdrew through a door which closed gradually without interfering much with the impression, and proving that only certain things were characteristic to the "subject" and, while these remained, we could spare those which he shared in common with mankind at large.

If the back of the head is normal it can be spared, or if the back hair of a woman is excessive or not coiled to please the critical, why not amputate these and concentrate where the head is more effective?

Danger lies in severing at a part where are many or attractive lines. These are bound to stimulate inquiry. We follow them naturally and are apt to regret their sudden evanishment.

In the effective decorative panel by Mr. Demachy (Plate VI), we feel there might be all degrees of interest in the figure, and question if, after all, in such drapery, more of the figure would not please us better. The reason for cutting there, was doubtless the collection of vertical stalks of the tritomas which, together with the figure's lines, would have created an excess of the vertical tendency. The diversion by the great brilliancy of light calling our attention away from the edge and far into the picture, indicates a strong feeling for balance.

But the idea of the background is not alone that of support. It is contributive as well: (1) By its area pure and simple, giving great distinction oftentimes, as may be noted in the

**Other Uses
of the
Background**

spacious setting of the royal personage upon canvas. Here, like the great actor, he fills space by virtue of his presence and his conceded importance. A timid little every-day man, of domestic habits and small assurance, does not need this amount of air about him. He does not have it ordinarily. (2) The background is contributive by suggestion, and in this range one easily passes from the simon-pure portrait to the picture portrait. When the subject is placed among objects of intimate association, the formality which necessarily attends portraiture is removed and the idea conveyed is not only the man, but the man in his own life, the woman at home, the child at play.

A third degree is that in which the background or supporting area may assume such interest that the result becomes genre, with a consequent sacrifice of the portrait's dignity. Although the portrait-at-home idea has its recommendation as least objectionable for informal people to whom portraiture in any form is repellant, it is, as portraiture, very rarely a success by reason of the undue attractiveness of the surroundings. The sitter usually becomes little more than an item in an arrangement of bric-a-brac, and the classic quality of the portrait vanishes.

Separate and apart from this, however, is another distinction in portraiture with which the background has largely to do, namely, that of the portrait, real and ideal.

It becomes the ambition now and then of the figure painter and photographer to express the

type instead of the individual. Whereas the only thought of the likeness is reality, by expending this it may be employed to represent the whole of its kind. The woman may stand for womanhood or motherhood.

The Real The art of Geo. DeForest Brush clearly expresses these distinctions. One of his pictures discloses an artist seated on the floor limning a group of mother and two children. The reality of this is so explicit that the artist discloses even the manner of accomplishment. In another picture he shows the same group of three, with the artist omitted and the three faces staring out of the canvas at some one, without doubt the painter. The connection between cause and effect is unmistakable and the willingness of the models is pronounced, for their expressions read, "Take me." This is portraiture.

The Ideal Other renderings of that same mother and children express a different point of view on the part of both painter and model. Without notion of the artist's presence, and with no desire to serve the machinery of art-production, the mother and children have been observed and preserved upon canvas. The first thought is motherhood and childhood; the second, of certain members of the human family who have been used to express this idea. By reason of the idea, these pictures enter a broader class than portraiture. The opportunity which portraiture offers has always this broader range. Mr. Steichen presents the sculptor or the painter or the reader *and* the individual, as in Plate XII. The portrait may be a record only, or that plus

art, or both, and an idea—three grades. An editor may choose to rise no higher in his sphere than the reporter and content himself with statements, but another will detect the opportunity to clothe these in such a manner that their force will be augmented by the art of rhetoric, and he may also make it applicable to general truth.

The surroundings, of course, must be compatible with the varying phases, the classic pillar, or the Vandyke background of brown trees and sky, will not fit the former. Their use creates an added distinction as accepted paraphernalia in the realm of the ideal. The portrait ideal, in breaking from the purely realistic, breaks upward and enters a higher stratum. The fine feeling of the best art intelligence must dominate in it. Anything less could not be ideal. Whatever the idea be which is conveyed, it could only become active and move us by the completeness and care of its transmission. The little obstacles over which we must step would bring our vision to earth, and the broader and far-away vista would be unseen. In "The Staircase," by Mr. White, we discover this reach, higher than the real.

Examples of the subject sacrificed to the larger idea are met with now and then in English and continental art, the Royal Academy and Salon now and then containing the modern figure almost disguised in ancestral armor, ye goode knight living for us again in the twentieth century.

**Arms and
the Man** The flavor of the courtly days
and the possibilities pictorial which
they offered were so obvious an
advantage, that in Munich a serious attempt was

made, a number of years ago, to introduce the knickerbockers, lace collars and the elaborate ornamentations of the sixteenth century. It was the notion of the German painters, and they persistently affected this garb for a number of months, hoping to bring it into vogue. The effort was a failure with the people at large, but for them the intention did become active for a time in portrait art, limited to the area of the gold frame. The scion of the family looks as "stunning" in a ruff and black velvet doublet as his great-grandfather did, and the concession seems a slight one to the license of art.

Strange it is, in all the search for the new possibility in photography, that this picturesque phase of portraiture has been untouched. What wondrous Rembrandt heads might yet be created with a broad collar and the right hat, and what a gauze of antiquity, what flavor of the far-away with which to surround and shield the modesty of the modern one who, timid of this vanity of portraiture, may plead the clothes as the reason, and himself as acting in the capacity of lay figure, the garments the cause and himself made useful for effect.

THE COMPOSITION OF TWO FIGURES

The union of a single figure with its frame will present about all the known difficulties in composition, and that of two figures a few extra. With three figures, things are less distracting and become more settled. There is a reason for this which any one can obtain who will mark out a

rectangular space and attempt to compose three separate objects therein. At three and beyond this the difficulties suddenly lessen.

Principality The first question, and very often embarrassing, is who shall be first. One must be subordinate, for two cannot be principal. To have this point settled in any but a perfectly explicit manner, will not yield good art. That is the trouble with most of it, this attempt to make it do so.

The three grades of portraiture just mentioned will regulate the attempt. The deliberateness with which this principle is violated or conserved will denominate it as a record, or a work of art above and beyond the technical.

There are examples of every possible degree of reserve in the second figure of two-figure composition, from Mrs. Käsebier's portrait of a little girl in the nude, her mother bending forward so as to sacrifice herself completely, to Mr. Sargent's portrait of Mr. and Mrs. Phelps Stokes, the lady standing forward and the man in fair assertion behind.

One of the most charming of Mr. Sargent's double portrait canvases is that of a boy being read to by his mother. The mother sits behind and to the side, the boy, lost in the maze of the story, dreamily gazes at you. It might well be entitled "The Story," for this is the picture's idea. The first intention of the painter, however, was the portrait, and he hung the arrangement of two sitters upon this incident.

No sportsman shoots off both barrels at once. He holds one in reserve. No two acquaintances

attempt to shake hands and engage us in conversation simultaneously, unless they be two women, and then they oblige us to make the embarrassing distinction in addressing an answer to first one and then the other. The gentle art of etiquette doth also apply in the graphic presentation of those we introduce. They must appear in succession. The average degrees of solution for this problem are shown in Plate VII. The two in profile (Fig. 1) have at least given us the unconscious quality, and we feel a certain unity in action and expression.

The other couple (Fig 3) still hark back to "that former time" with, by the way, one forward step to be noted. The man has offered his chair to the lady. The photographer used to explain that he had the man sit and the woman stand, that their heads might come nearer together. A good reason, but with better solutions possible to it. And the eyes, how extremely important this type of photographer deems them! They must engage the observer and thus secure a speaking likeness. All eyes are of the same shape, a fact that applies to none of the other features. It is the encasement of the eye that is important for character, and this is as well seen with the eye closed as open. The photograph at home is here announced with the curtain, the item of objection usual to such placement of the subject. With this out, the picture on the wall serves as the balancing item within the angle.

Fig. 2 has the quality of reserve tone, the mother thereby being somewhat sacrificed to the daughter. A more completely artistic arrangement

could have been effected by the abasement of the eyes. But the picture possesses a certain naïveté, reminiscent of the early German masters. In Gérôme's picture of "The Consultation" (Plate VIII) is presented this problem, with none too good solution.

In the respect of principal and secondary the two figures are well conceived, but their placement at either end of the table forces us to weigh them out separately, the white figure against its dark background and the dark one carefully relieved against light. Light being more attractive than dark, we have the sacrificing figure creeping back into prominence through its chiaroscuro and the area of secondary interest being called upon to force an effort for the principal. In this range, the whole background carries too much attraction, cut as it is into definite thirds, the center containing the allurements of an out-of-door vista even though in tapestry.

What if the reading figure were lost more by envelopment in a demi-shadow or by less pronounced relief, and the space behind the listener were simplified by a gradation over a larger space?

In the same grade of genre one feels that Mr. Vibert's arrangement has the best of it. Instead of separating the lights of his picture, he has massed them, gown, table-cloth and tidy, forming a more compact area of attraction than the long right angle stretching across the other picture. The dispersion of the upper tone by graded values in the chair, stocking, books and lantern, is more subtle and covered than the spot occurrences of the other.

Subjectively also the composition is stronger, as the mind does not pause to inquire "what first?" Yet again, the mental association, active and intense, existing between the two personalities of Gérôme's picture helps strongly to form a union of motive where technical placement effected an opposed and antagonistic entente.

The three phases of the portrait must just here be enforced,—the **Three Phases of Portraiture** portrait as likeness, the portrait as ideal, and the portrait as genre.

Under this classification there cannot be sustained so exacting a demand for pictorial requirement in the two-likeness portrait. There may be several reasons why two are put on one canvas or one plate. Besides, for instance, reasons for association, it may be a wish to include both in one frame to economize space. Under these conditions there is small reason why one figure should not be as important as the other. The main point should be that the lines of the two should combine without friction and that the two together should form good light and shade. If these are secured, the mechanics of composition are satisfied, technical quality may be added and the delicate principle of "Principality" may be reserved for what aims to be perfect work. It must not be forgotten that there are certain desirable attainments in photography which by their nature are disqualified from the higher realm of art. The non-conformist is a man with a personal creed in which there is often much crude wisdom.

To judge a man, for whom morality and ethics

are sufficient as his life's inspiration, by the standards of revealed religion, is to misapply justice. The terms of the indictment overreach all around and fail to fit at but few points.

Art is essentially emotional and temperamental, and has a large claim for our indulgence on this basis. The bad boy who breaks all the rules of the house may have such winsomeness withal that we learn to forget this, and could not live without him, but the good boy of equal charm for whom apology is unnecessary has our larger affection.

THE GROUP

Keeping the idea of unity in mind, let us consider its application to several figures, or the group. The binding of these together is a simpler proposition than the combination of fewer members because of the greater number of points of attachment, yet in that degree in which the design is neglected does the task become involved.

This demands a reminder of the full significance of unity as the great governing idea of art. Let me make it plain over Coleridge's definition of art: "Art is the middle quantity between the thought and the thing." The middle quantity, or that great regulator between the extremes, the intermediary, bringing them together in reasonable coalition. Just as the stable middle class is the saving element in the social cosmos, or the middle tint is that with which the artist starts, departing thence to the two extremes in his search for "effect," so this middle quantity is the

link joining the idea in the one with the means of the other.

Unity of Thought is a proposition containing all the moral and æsthetic doctrines of art. "Do men gather grapes of thorns, or figs from thistles?" Nay, rather, they get the grapes and figs at the fruit-stand and let the thorns and thistles alone. If the average man is possessed of this amount of discernment, why should he read volumes filled with good reasons for behaving rationally and logically over the joining of his ideas with a suitable exponent form? Unity of thought must govern the conception through the sequence of the ideas contained.

In Cormon's "Return from the Battle of Salamis" (Plate XI), the thought is victory; its exponent elements are exultation, joy, pride. The expressions of feature and attitude set forth these ideas, and the single impulse, the stimulating emotion, the onward sweep, mean victory. In another group, "The Homage of Venice" (Plate XI), the idea is homage, and the wealth of Venice is spread out before Caterina Cornaro. The exponent pictorial elements are kneeling figures, gifts offered, deference, attention, and, as we view these in varied expression all over this great canvas, the dominant thought of it is spoken to us.

The Unity of the Thing gets us out of the range of æsthetics, and quite into that of mechanics. Here we become very practical. It means the favorable placement of these elements where they will do the most good in the exposition of the thought. It

means the clever joining of one figure or group to another, so that it shall be the most helpful and the least harmful, and the latter consideration is more difficult than the former.

Given a good stage full of actors,
Cormon's M. Cormon has played them off in
"Cain" that large and simple manner which gives such tremendous unity and power to his "Cain and his Family Journeying Through the Desert." This canvas, hanging in the French National Gallery, Luxembourg, is by many regarded as its greatest possession. Surely, not by virtue of its color or sense of *plein air*, for it has little of the former; lacks the latter, as the figures doubtless posed for him in a studio, though the scene demands the shimmering atmosphere of the burning desert. Its grasp upon us comes from the intense concentrated purpose of *motion forward*. "And Cain shall be a wanderer." Here he is. Moving at slow and measured trot, his eye fixed on the distant line of the horizon, he has but one thought which drives him onward, that he must keep going, and his children and children's children follow after him at marked pace in a small compact procession, stern sharers with him in his grim determination and the labor it entails.

Here is that unity of thought which has created a masterpiece, made intense by the contributive force of each figure under control of a single idea.

When working in and about the potential elements of a picture, we discern a master thought, purpose or emotion which, by its easy assimilation with the realities which we see, forms an unstrained junction therewith, then the union between the

thought and the thing has been accomplished and a work of art is the result.

The Thought in Landscape But let not this definition trouble us. Definitions are seldom so just as to be universal. Not infrequently the epigram becomes a handcuff, as Mr. Van Dyke suggests. We may look at our transcript from outdoor nature and question concerning the idea of the picture. We must confess, oftentimes, it is no better off than the simple lad of the past who "whistled as he went, for want of thought"; yet if there was any art about the boy it was the whistle—that "little music" which Corot tells us was the essence of his art. The thought contained in these simple transcripts is a reflective one from nature herself, such as she may frequently impress upon a true lover of hers, and under which sentiment he is stimulated. His labor is, then, more often directed to maintaining the pure impression by elimination of what is damaging to, or destructive of it, than by any personal creation.

The Poetic Interpretation of Nature When, however, the artist rises above mere imitation, seeking to make more essential or emotional the natural fact, he interjects his thought or idea upon the scientific reality. Thus the flock of sheep by Mauve is, after all, but a broad splash of buff light, with shadow in perfect value, and legs, heads or tails, as mere indications; or the clothes and draperies in the portraits of Carriere, only suggestions of something in very good value, used to obliterate nudity. This aspect of nature clearly states that the idea of the thing is worth more to the artist than its

reality, which, if stated, in all of its scientific truth, would leave no opportunity for this necessary part of art.

Tolstoi's Definition Tolstoi, in his exhaustive treatise on art, finally defines it as "a human activity consisting in this, that one, by means of external signs, hands on to others certain feelings experienced, so that others are affected by those feelings and also experience them."

The definition makes art a question of feeling, and this point no worker in art must forget. The transcript, pure and simple, is expressed in terms mechanical and scientific; it is modulated, regulated, readjusted and redeemed as seemeth best to man, or accepted as found, and signed by him as containing inherently just that feeling that is his. Here, then, is that warrant for man to tamper with the natural fact. He must put himself in somewhere, for art must be personal and contain thought, and the man must supply it.

Let us make application of it in the regulation group of the college graduating class, generally disposed in rows on the college steps, but of late made even more formal with especially arrayed apparatus. The photographer of some of these groups will certainly have to suppress the "artist" in his recent title, and may use "scientific," with good reason, instead. But why should art insist upon insinuating herself into what does not need or solicit her!

Comparisons When she does come, her touch expresses just that difference between the formal page of printed types of the Harvard seniors (Fig. 2, Plate IX), grouped out-

side the University building upon a temporized show-case, and the group of Yale seniors (Fig. 3, Plate IX), massed upon the classic steps of old Eli. Whether or not this arrangement was a happening, the writer does not know, but certain it is that a better arrangement could hardly have been attained by calculation. In this the decided linear tendency may at once be discovered. An interweaving of several curved lines. This has deprived Yale's picture of that chinchilla effect, the units shot aimlessly at the picture plane, the only result produced being one of variegation, and has made each of these units contributive in a scheme of line. Note the figure one third from the right side, the highest of the seated figures. He becomes the apex of a short and a long side of a triangle, which lay hold of either extremity of the picture's side. He is not sitting on the top step, but kneeling, and, I take it, was placed there for a purpose. Besides serving at this point, he also breaks the formal line of heads of the top seat, as well as the formal oblong space of those standing. Another block to this formality is found in the group of half a dozen on the left, one-third distant from the edge. From this space all the lines fall at an angle to the left side, the same tendency being noticeable from about the same point on the other side. The straightness of the top line of heads is broken by a couple of uplifts, at about one-third from the sides, a point to be referred to later. Just here, however, the looser line of the Princeton group (Fig. 1) has much the advantage, to which is added the snap of light and dark.

The whole plan, therefore, conforms to our notion of well-organized spaces, well connected, and the whole unified, in terms applicable for other known pictorial structures; and, without having friends there to be picked out, one would stop and agree with it on the structural basis, and take a delight in these sweeping lines and their rhythmic occurrences. With how much more respect must such a souvenir of college days appeal to a man in after years, when, as time passes, less of the personality of it interests him and it at length becomes a memento, than that other in which one must feel increasingly the artificial constraint of that single moment of premeditated unreality. In time such a picture must find its way to the garret—in time, when the æsthetic sense rises above the high reach of college sentiment, and the man is willing to agree with his wife, that she can't stand it any longer.

But Yale's picture, as an epitome of college life, will continue as a work of art also, and maintain its hold on the heart and its place on the wall.

But as to the "Salamis" (Plate X),
Control by the thrill it imparts is entirely upon
Thought this basis: the complete absorption
of the mechanics of the picture to the enveloping
thought; the real included in the ideal. Thus we
get into the movement of the procession, and
want to shout with them; thus we come to ap-
preciate the meaning of the forced action of walk-
ing, not alone by reason of the heavy weight of
armor, but because this is suggestive of a more
cadent swing, which furnishes a time for the
victorious pæan.

If, then, we have our artist's notion, the lesson of it lies in his method of execution.

A procession stretching from one end of the canvas to the other is often but a section of something. It may contain much of interest, but it has neither beginning nor ending, nor completeness. While suggesting continuous forward motion, M. Cormon has kept our thoughts and eyes in his picture by turning the line well into it through the circling of palm-waving maidens. Such a line in its monotony is weakened by the line of the receding shore, and broken by the palms and spears. Note further, at points spacing this line in thirds, there are two uplifts: the mounted figure and the largest palm. This arrangement, by common consent, appears to be employed by the best artists—a division into thirds of a long attractive horizontal space.

In Makart's decoration, "Caterina Carnaro," receiving the homage of Venice (Plate X), he has placed his chief figure at the first third point, and the other third is also emphasized. A superficial view will thence lead to the whole scheme of construction—two pyramids with two side supports, also pyramids. Though these chance to be higher, their figures play to the principals, and they are sufficiently interfered with by counterlines and reserved in half-light to be contributive rather than detractive. This picture is a study in the important problem of sacrifice. We may count eighteen or twenty figures in positions nearer to us than the principal, all of which, by virtue of such placement, being in danger of over-attractiveness, and which all, by special posing, have

been made to build up and approach rather than obstruct it.

Sequence Unity of the thought and thing is also found in sequence of action, which, in this great concourse, is no less observable than in the "Chess Players," or the "Dice Throwers" (Plate IV), or "The Holy Women at the Way of the Cross" (Plate XI). In this latter there is an unfolding of the forces of the picture, and the same dramatic energy that one sometimes sees in a football play—a whirl of counter-activity, originating at one point. The work is especially profitable for photographers because of its tremendous movement, notwithstanding every figure is posed firmly. The effect is accomplished by the arrangement implying change in each individual. The Virgin has fallen and two other figures have instantly become active, the degree of action being indicated in the drapery. The other figures shrink or press forward. It is a study of temperament, responsive in varied emotions to the same suggestion.

**One of the
Secrets of
Motion** But if unity of the thing is dependent upon sequence, how can the street scene be used as a subject in art? Here every figure is independent, going his own gait. Though unity will lean with greatest reliance on simplicity of arrangement and follow hardest, with its commendation, after such subjects as express it,—the setting sun drawing after it the clouds in its wake, the plowman following the beck of day, the person in a group toward whom all eyes turn—yet it cannot obtrude more than the prin-

ciple it contains upon any chosen case. If the artist sees a sentiment in the thronging street, with its varied conditions of men, and wishes to express it, he should do so with the penalty clearly in mind for sacrificing this art quantity.

With this before him, he will await the chance for the sequence of line, the evolution of mass, and, if possible, too, find a sequence of thought somewhere, assured that thereby he has bettered his subject.

There are many subjects that prove entirely ungrateful, that must be rejected, and we reject them largely because they lack this.

THE FIGURE IN LIGHT AND SHADE

The figure as a pictorial factor is enhanced with its possibilities in chiaroscuro understood.

A scheme of light and dark every picture must have, for without it the force of the statement is crippled.

Force is attained in the degree of contrast, but the essence of the question lies in relation of tone.

Three are enough; the great
Low Key middle tone, one above, and one
or High below. The upper and lower tones may be divided each so that there be five, but three are sufficient. With these divisions of the tonal possibility in mind, the degree of light and dark is immaterial. The musician may choose to render a motif *pianissimo* or *fortissimo*. The music remains unchanged. A painter may elect a low key or high; his main thought is to keep his subject in relation. Israels, the famous Dutch

painter, in discussing the matter (himself usually a low-tone painter) says he never thinks of this point, letting the sentiment direct him entirely: the right view for all temperamental expression.

Were a camera club, by way of self-improvement, to inaugurate a competition in which each subject should be rendered in three tones, a fourth under protest, and the fifth under fine, it would prove a revelation to many members, and in a short time one could look for very distinguished results in that community.

The discipline thereof would be in the preservation of the organic quality of the subject. This signifies the effect revealed in the plan, the cause and effect at a glance.

One can cut into and hack away at this, changing and substituting and introducing other and oftentimes necessary elements; he may do this up to a point and still have his structure survive, for its great strength is a result of its great simplicity, but beyond that point he may not go or the scheme is annihilated.

The complexion of the scheme, whether of much dark or little, must be regulated by that which we think is of most importance to secure, knowing that end of the scale, the most limited as to space, will be most in accent by what is contributed to it. White in small compass surrounded by black and gray will be more intense than if its space is larger.

It will, of course, however, carry more effect in an enlarged space. The same proposition applies to black, which, contrasted with increased spaces of white, is made more intense.

The Degree of Attention The picture space divides itself into areas, those which carry the subject and contributing areas. In the case of a portrait, figure picture, or where the subject proper occupies a large part of the space, the supporting area, in its demand for suppression, often demands greater care and judgment than the subject itself. Here by a light or gradation we may either enforce or destroy things valuable in the subject. For this reason the supporting area is best delegated to the gray tone, the black and white being saved for more important duty. In the portrait by Velasquez (frontispiece), the simple force of the three tones is made manifest, and the explicit sense of the light reserved in smallest measure is quickly realized. Light is more attractive than black, black than gray. Here is stated the succession in importance of the spaces these tones occupy.

The same scale is used in the picture of the Holy Women, the white consigned to the Virgin, and dissipated in smaller touches through the other figures. The support of black and white tones lies in the gray complement of the rocks. The reserve in the draperies is an element of great force, and it is this simplifying of tones as seen in the black and white, which frequently claims our preference when compared with the colored original, wherein the variety of hue frequently becomes disturbing, we fall back with greater satisfaction on its monochromatic simplification.

A glance through the accompanying illustrations will prove the middle tint to be more serviceable for reserved spaces, or for parts of secondary inter-

est. The effect is no less striking in the portrait of Ada Rehan (Plate II) than in the "Buffoon" of Velasquez, a canvas of the same relative proportions, the former of which replaces white for the black clothes of the actor. The background in both carries the middle tint and the black and white find easier and more atmospheric relief against it.

In Figs. 3, 5 and 6, Plate III, and Figs. 1, 5 and 6, Plate V, the subjects in white and gray are relieved against black. The outlines therefore are not only more in evidence and less enveloped, but small sense of atmosphere is suggested and the effect produced is a degree more arbitrary and direct. The close proximity of the deepest dark and highest light in Fig. 2, Plate III, with the outlines of the hat and figure merging softly into the background, is an effect most sought after by Rembrandt, an arrangement of tones which in the hands of the unknowing is in danger of easily becoming banal. Should such a scheme lack the mollifying qualities of tenderness in other parts, its extreme force of effect at one point would unbalance the other parts of the work.

Gray is an excellent foil or balance for black and white, since gray is a mixture of these two. When, in the group of two or three, we have black and white figures in conjunction, an opposing figure in gray produces a very favorable combination.

Simplicity Or, if there be but two figures, the positive ends of the scale may be represented by a single one, the costume part black and part white, and the other wholly in

gray. Or, again, the full scale may be presented by giving the sustaining parts the positive quality of tonal space—a distinct part with its distinct color. Much of the confusion which finds its way into pictures might be eliminated by careful re-editing for simply statement over three tones.

With Mr. Steichen's portrait (Plate XII), the great force lies in its thunder-clap effect, light and dark brought sharply in conjunction and little gray allowed. There is nothing more startling or mandatory than the lightning flash and the resulting peal. Nature gives us very little else to think of under those conditions. With this treatment of the subject the artist's desire to show a man engaged with his paper, and that only, is clearly manifest. We may look for other things in vain. Such work lies at the extreme end of the scale toward which photography has been journeying since it decided there were other things worth thinking of than "detail" and "sharpness." Here is the essence; the result reached by depriving the work of one thing after another until no more can be spared without damage to the idea. Here then, too, is the base line of the intellectual side of art in its relation to composition.

Starting with the idea to be stated, how little else may be included? The ratio is the same as with the scale of chiaroscuro. We sacrifice at one end and gain at another. What little is shown is dignified by the contributing space which surrounds it, and when the conveyance of the idea is effected by little, the idea is allowed its course to expand and fill these spaces which would otherwise claim our attention with things of less import.

The conception in two tones, and that of three, with the lesser findings swept aside, has, therefore, its reason at the best of sources, and plays into the hands of artistic "effect."

Although those three tones are more forcible and decorative when used without any gradation, the use of this quality will be found of most important services in many instances.

Gradation ^{vs.} **the Flat Tone** denotes movement. The flat tone is of such discourse as makes statements and rests. The gradation is discursive, and we follow easily.

For that reason, as a factor moving among the less important parts, it serves to effect the union of the principals, weakening or strengthening, wherever the demand arises. The gradation of a background is frequently the saving grace for an otherwise irritating ensemble.

The gradation upon the figure itself will serve to direct the eye whithersoever the artist willeth.

In Mr. White's "Staircase" (Plate XIII), we feel the easy, upward movement of this element with a concentration toward the black and white of the breast and body. From this area the tones fall back in every direction; for the most part in an even diminuendo.

A different type of gradation and none the less serviceable, is had in Mrs. Bennett's "Olden Days" (Plate XIV), where the surface of the upper part is broken and varied, the light led into the supporting dark with the greater energy of spots and masses. Everywhere the supporting spaces yield naturally to the dominant lights of the figures.

THE INTELLECTUAL SIDE.

The present number has dwelt upon the scientific qualifications of the subject. These are necessarily practical, and practical because necessary. This point must be made. But too much credit cannot be given to those who push successfully into the realm of intellectual art.

With an idea to present in pictorial adornment—ah! how the limitations of photography then handicap one—the right type, which means search long and critical, and sometimes the education of the model, and with this at length secured, such appropriate setting as the idea demands. Here the painter's art of straight creation has the advantage. Instead of searching the earth for what we want, we help ourselves to the storehouse of experience, or pure fancy. Let not the painter forget this when he says to the photographer, "you have the essentials given you." Aye, but how much too much, oftentimes, and how inflexible.

So let the idealist with the exacting limitations of his theme, and the realist who ignores makeshift, and who creates his work in its varied components out of the well-springs of "the possible," "the probable," "the appropriate" and "the exact," as his critical sense demands, have large acknowledgment in the scales of judgment, as in the sifting and winnowing of this present time, we would acknowledge the claims of true art and honor her real fellowship.

HENRY R. POORE.

Notes and Comment

Maybe you think you appreciate the place and function in modern life, of "moving pictures"—already a commonplace to most of you, dear readers, on the technical side at all events. But you need to read "Mrs. Bathurst," to make your knowledge completer on the emotional side. There's alchemy for you—turning the machine's lead and steel and celluloid and canvas to drops of fiery red-hot gold—or is it blood dripping from a wrung human heart, as it might be yours or mine?

It is a Kipling story, in the *Metropolitan* for September—a story which makes of the printed page a mental stereoscope, through which you see "objects in relief"; the little group of four men's hearts forming a peephole that opens upon the deep seething lava-lake that is called life. Just a slit, but it blisters and blinds, only the glance! Some like vision must the Hebrew poet have had when he wrote: "Such knowledge is too wonderful for me." So to see into the hearts of mankind—those whose elbows touch ours—would overwhelm and consume, like the breath of Mt. Pelee. But, stay! you may not like Kipling. There are also those whom Burgundy never warmed, body and soul—whether from want of temperament or of opportunity. We will not quarrel or even pity; merely admit; and call attention to the use of the cinematograph as a literary motive. [C.]



Here is a pregnant passage, also from the September *Metropolitan*, where it occurs in Max Beerbohm's essay on "Whistler's Writings."

"But you do not dispose of a man by proving him to be an amateur. On the contrary, an artist with real innate talent may do, must do, more exquisite work than he could do if he were a professional. His very ignorance and tentativeness may be, must be, a special means of grace. Not knowing "how to do things," having no ready-made and ready-working apparatus, and being in constant fear of failure, he has to grope always in the recesses of his own soul

for the best way to express his soul's meaning. He has to shift for himself, and do his very best. Consequently his work has a more personal and fresher quality, and a more exquisite "finish" than that of a professional, however finely endowed."

All of which is worth pondering, by both sorts of photographers. [C.]



Further, in the same issue, are to be noted the illustrations from photographs by Eickemeyer, around which is written the article by Sidney Allen: "Along the Seashore"; and the article "A Portraitist of Personages: The Camera Art of Ernest Walter Histed," with sixteen reproductions of examples of his notable work. [C.]



Modern Dark-Room Screens. The excessive sensitiveness of the plates used in the three-color process of today demands a corresponding degree of safety in the illumination of the dark-room. H. Calmels, in *Le Photogramme*, recommends the following method of securing screens for this purpose, which transmit only the extreme red rays, in the vicinity of the A line of the spectrum.

Fix two unexposed gelatine dry plates in a fresh hypo fixing-bath until perfectly cleared, wash and dry. For the first screen, prepare a bath of 3 grams ordinary methyl-violet in 1,000 cc. of water; for the second screen, a bath of 6 grams tartrazine in 1,000 cc. of water; immerse the plates until each is saturated with its respective dye; rinse superficially, dry, and superpose. The yellow (tartrazine) screen alone furnishes a safe light screen for the manipulation of wet collodion plates.



The Photographic Society of Marseilles announces its Third International Salon of Photographic Art, to be held January-February, 1905. Full particulars can be secured from the Secretary of the Society, M. Edouard Astier, 11, Rue de la Grande Armée, Marseilles.



A Roentgen Congress is to meet in Berlin at the Easter week of 1905, the occasion being the tenth anniversary of the discovery of the Roentgen rays. The congress will have as its chairman Professor von Bergmann, of the University of Berlin.

At the recent Salon of the Photo Club of Paris, 752 prints were shown, the work of nearly 300 exhibitors. According to the critics, the exhibits showed a high average of merit, with less tendency toward freakishness in choice of subject and treatment than has been seen in some previous exhibitions.

In connection with this Salon was held an exhibition of color photography, methods and results, showing the attainments of French workers along these lines in a very complete and interesting fashion.



THE KODAK COMPETITION. A detailed report of the results of the £1,000 Kodak Competition has been received in this country, and the results cannot but prove gratifying to those who take an interest in the advancement of American photography. There were something over 20,000 entries received, of which about 12,000 were from the British Isles, 2,500 from France, 2,000 from the United States, 1,700 from Germany, and 2,000 scattering. The British Isles received 229 prizes, the United States 85 prizes, France 28 and Germany 12. It will thus be seen that the British exhibitors received one prize to every 52 entries, the French one to every 89, the German one to every 141, and the American one to every 23 entries. Our American amateurs, in proportion to their entries, carried off over twice as much as their British cousins, three and a half times as much as the French competitors, and did six times as well as the German—at least such was the opinion of the British judges, who were no less personages than Sir William Abney, Mr. Craig Annan and Mr. F. M. Sutcliffe.

In their awards the judges diverted some of the prizes in Class B, of the Kodoid Competition, and in both classes of the Developing Machine Competition to the N. C. Film and Kodoid sections.

We are informed that the Kodak Limited will make a display of the best work at the Kodak Galleries, 40 Strand, London, the exhibition remaining open for several weeks. Doubtless similar exhibitions will be arranged for America in due course. The list of American prize-winners follows:

N. C. Film Competition—Class A: (3d prize) Miss Laura Adams Armer, Berkeley, Cal.; (7th) Miss Helen W. Cooke, Providence, R. I.; (8th) John S. Neary, Trenton, N. J.; (10th) D. J. Cartwright, Boston, Mass.; (12th) Geo. Adamson, Walkerton, Ontario; (14th) Thos. A. Morgan, Denver, Colo.; (20th) Geo. F. Fisher, Tucson, Arizona;

(22d) Albert H. Moberg, Chicago, Ill.; (23d) Miss Nellie Coutant, Crawfordsville, Ind.; (24th) Wm. C. Motteram, Philadelphia, Pa.; (32d) Miss H. B. Cole, Trenton, N. J.; (33d) Robt. G. Klotz, New York City; (37th) Eldred H. Keays, Ann Arbor, Mich.; (41st) Louis J. Christie, Quincy, Ill.; (42d) Henry S. Whitney, Chicago, Ill.; (45th) H. A. Rothrock, West Chester, Pa.; (50th) H. B. Conyers, Urbana, Ohio; (51st) Dr. A. R. Benedict, Montclair, N. J.; (54th) Ethyl Amelye Weisel, Williamsport, Pa.; (55th) Chas. Ziegler, Chicago, Ill.

N. C. Film Competition—Class B: (1st prize) John Dolman, Philadelphia, Pa.; (4th) Walter Zimmerman, Philadelphia, Pa.; (9th) Mrs. Nancy Ford Cones, Covington, Ky.; (13th) Edgar J. Parker, West Chester, Pa.; (22d) H. Mortimer Lamb, Victoria, B. C.; (23d) Thos. A. Morgan, Denver, Col.; (24th) Geo. L. Beam, Denver, Col.; (25th) Laurence Osgood Macomber, Pasadena, Cal.; (26th) Miss Florence Howland, Conway, Mass.; (36th) Chas. M. Carter, Denver, Col.; (43d) H. B. Conyers, Urbana, Ohio; (50th) Miss Grace E. Mounts, Morrow, Ohio; (55th) Mrs. Helen W. Cooke, Providence, R. I.; (59th) John S. Neary, Trenton, N. J.

N. C. Film Competition—Class C: (2d prize) A. S. Howard, Providence, R. I.; (6th) Laurence Ridges, Salt Lake City, Utah; (7th) Miss Laura Adams Armer, Berkeley, Cal.; (9th) Mrs. L. R. Graham, Pittsfield, Ill.; (10th) Miss Nellie Coutant, Crawfordville, Ind.; (13th) Thos. A. Morgan, Denver, Col.; (19th) Gustave Moeller, Milwaukee, Wis.; (21st) John Schuler, Akron, Ohio; (22d) H. B. Conyers, Urbana, Ohio; (29th) Chas. H. Loeber, New York City; (32d) Miss Elizabeth Hill, Woodsford, Me.

N. C. Film Competition—Class D: (2d prize) Miss Laura Adams Armer, Berkeley, Cal.; (8th) Wm. C. Motteram, Philadelphia, Pa.; (13th) Walter Zimmerman, Philadelphia, Pa.; (14th) Annie W. Brigman, Oakland, Cal.; (17th) H. B. Conyers, Urbana, Ohio; (20th) Geo. L. Beam, Denver, Col.; (21st) Thos. A. Morgan, Denver, Col.; (27th) Laurence O. Macomber, Pasadena, Cal.; (35th) Mrs. Myra A. Wiggins, Salem, Oregon; (36th) Miss H. B. Cole, Trenton, N. J.

Kodoid Plate—Class A: (3d prize) Miss Laura Adams Armer, Berkeley, Cal.; (8th) Thos. A. Morgan, Denver, Col.; (10th) H. Mortimer Lamb, Victoria, B. C.; (15th) Walter Zimmerman, Philadelphia, Pa.; (16th) S. R. Carter, Toronto, Canada; (28th) Chas. E. Wallace, Urbana, Ohio; (32d) Harry C. Rubincam, Denver, Col.; (44th) Chas. S. Price, Denver, Col.; (49th) Dr. A. R. Benedict, Montclair,

N. J.; (56th) Harold A. Ray, New York, N. Y.; (73d) Will E. Gladwish, Montreal, Canada; (74th) Sumner W. Matteson, St. Paul, Minn.; (75th) Mrs. L. R. Graham, Pittsfield, Illinois.

Kodoid Plate—Class B: (2d prize) D. J. Cartwright, Boston, Mass.; (21st) Louis R. Murray, Ogdensburg, N. Y.

Developing Machine—Class A: (2d prize) Miss Nellie Coutant, Crawfordsville, Ind.

Developing Machine—Class B: (2d prize) Miss Nellie Coutant, Crawfordsville, Ind.; (8th) Harry R. Cate, Haverhill, Mass.; (11th) Mrs. L. R. Graham, Pittsfield, Ill.

Special Prizes: T. G. Cochrane, Morristown, N. J.; Miss Louise V. Hitchcock, Yonkers, N. Y.; J. Brunner, Pine Grove P. O., Fergus, Mont.; Henry Troth, Philadelphia, Pa.; Wm. C. Motteram, Philadelphia, Pa.; Laurence G. Reid, Greenwich, N. Y.; H. C. Rubincam, Denver, Col.; Miss H. B. Cole, Denver, Col.; G. F. Fisher, Tucson, Ariz.



St. Louis Fair Notes: Giacomo Brogi, an artist from Florence, Italy, who is the photographer to the Court of Italy, has installed a collection of pictures in the Italian section of the Palace of Liberal Arts. The pictures are intended to show the versatility of the exhibitor in his particular line of work, which is photography and the publishing of pictures of various kinds. They include creditable photographs of street scenes in Florence and other cities in Italy, and several portraits of the royal family of Italy.

About fifty large photographs, illustrating scenes along the line of the new Sanitary and Ship Canal of Chicago, have been added to the exhibit of the sanitary district of Chicago in the Liberal Arts Building. Topographical models show how the canal has been completed from Chicago to Joliet, and the photographs illustrate some of the problems of engineering which have been overcome.

The G. Cramer Dry Plate Company is among the few photographic firms who have a display of their goods at the World's Fair. The Cramer booth is located at the intersection of Aisle G and Aisle 4 in Block 53 (second aisle, directly opposite main entrance), in the Palace of Liberal Arts. Amateurs and professionals are cordially invited to make the exhibit their headquarters at the Fair, and to see its many interesting features. We believe this to be the only exhibit of a dry-plate concern at the Fair, and it should not be overlooked.

Many new color sensitizing dyes for use in orthochromatics, as well as dyestuffs used in the manufacturing of light filters and for three-color printing, have recently been introduced on the European market, by the Meister, Lucius & Bruning Co. Doubtless our readers have seen these products mentioned in the European photographic papers and have wondered where they could be obtained on this side of the Atlantic. We are informed by Victor Koechl & Co., 122 Hudson street, New York, that they handle these products in the American market and will be glad to supply any of our readers desiring small quantities for experimental purposes.



From E. G. Koenig, an enterprising dealer in photographic supplies at Newark, N. J., we receive the special camera number of his business brochure, "Shots." This announces a nine days' photographic trip to the World's Fair, offering special facilities for amateurs at a very moderate figure. The little book is very brightly written, and lists a few special bargains which eastern amateurs should see.



A very handy condensed price-list of apparatus and supplies reaches our table from Charles Kuhn, 489 Fulton street, Brooklyn, N. Y. Mr. Kuhn has built up a prosperous business in Brooklyn by specializing on the supplies and conveniences most used by the intelligent amateur. His list is a handy guide to all the goods in this class, and can be had upon request.



A cleverly written and very practical handbook has just been issued by the M. A. Seed Dry Plate Company, St. Louis, with the title: "The Art of Negative-Making." It is the work of Mr. Huiskamp, the chemist of the firm, and explains, in simple language, the elements of negative-making and the advantages of the Watkins or factorial system of development. The formulæ given throughout have been thoroughly revised and adapted to the factorial method, and the book offers a complete guide to the many specialties of the M. A. Seed Dry Plate Company. A brief extract will serve to show its helpfulness to the photographer: "The real measure of efficiency in a dry plate as a medium is this capacity for harmonious gradation. This means truthful representation of the subject's contrasts in the positive. Violent contrasts do not come within the range of truthful representation of the best plates. That is, in subjects

with harsh concentrated lights and deep, black shadows, an exposure sufficient to give detail in the shadows will cause the high-lights to become degraded and fuzzy. The range of gradation is more in some plates than in others, most in Seed plates.

"Latitude and gradation capacity are the same thing. If one plate can reach over a wider range of light values at correct exposure, it must also permit of a wider range of exposure, with minimum loss of values. There is no relation between latitude and speed, though, as a usual thing, plates of medium speed have the most latitude. The plate is a measure by means of which the relation of light intensities in the subject is recorded. As uniformity in speed and quality give precision to result, gradation or latitude gives greater extension of that range in which good representation is possible. In these qualities the Seed plate is supreme.

"We have spoken of the gradation capacity of the Seed plate, and a practical hint as to how to light the subject naturally follows. Naturally full use should be made of that capacity. Do not abuse it with a harsh violent light, or slight it with a flat diffused one. Seed plates are fast, fine-grained and soft-working. They require brilliant, round lighting. They produce the greatest amount of modeling. Study to produce roundness, strength and atmosphere, and avoid unnatural harshness."

A copy of "The Art of Negative-Making" will be sent to all who mention this magazine. Requests should be sent to the home office of the company, at St. Louis.



Two new printing papers are being introduced by Griffin & Co., 2 West 92d street, New York, under the trade name of Carbona Papers. The first is a watertone paper giving a wide range of tone from sepia to black; the other is a print-out paper containing neither collodion, gelatine or albumen and yielding rich tone gradations even from poor negatives. We recommend an early trial of these papers, further particulars of which may be found in our advertising pages.



A booklet describing a very ingenious, and what looks like a very practical hand-camera, reaches us from the Hales Camera Company, Ridgewood, N. J. The new camera is the invention of Mr. H. W. Hales, a veteran in hand-camera work. The instrument has no ground glass, no mirror and no finder, and yet the picture is seen right

side up, the full size of the plate, and is visible right up to the instant of exposure. The camera is fitted with the focal plane shutter, adjusted for time or high-speed work, and may be used in the hand or on the stand. The interested reader should write to the company for further particulars.



Mr. J. F. Adams, the popular dealer in photographic supplies, of Buffalo, advises that his business has no connection whatever with any other firm, being conducted only under the name of J. F. Adams, with main store and office at 459 Washington street, Buffalo, where the business was established. The uptown branch is at 564 Main street, Buffalo.



The *Times* for August contains a suggestive paper on "Seaside Photography," with illustrations by H. K. Landis, showing how to secure effective compositions as well as technically good negatives in this difficult branch of work.



We are advised that the following English books are out of print. Denison: *Photogravure*; Leaper: *First Principles of Photography*; Robinson: *Pictorial Effect*; Young: *A B C Retouching*. The following books are reprinting. Bayley: *Photography in Colors* and *Photography in a Nutshell*.



Amateur photographers are beginning to appreciate the advantages offered by their familiarity with composition and light and shade effects in pyrographic work, and this branch of art craft is quickly winning popularity in the photographic field. Those who have not yet made the acquaintance with the platinum point as an art tool should get Catalogue No. 3, just issued by the Flemish Art Company, 47 West 21st street. This firm is the largest wholesale house in the trade, and shows an unusually wide range of apparatus and blanks for pyrography.



The Bausch & Lomb Optical Company, Rochester, N. Y., send to our table an advance copy of their semi-centennial catalogue of photographic lenses and shutters, marking the completion of their fifty years' work as manu-

facturing opticians. The catalogue is extra-illustrated with many fine specimens of lens and shutter-work, and the text has been made interesting by the inclusion of much practical information on the choice and use of lenses for different classes of photography. Copies can be had on request by mentioning THE PHOTO-MINIATURE



Catalogue No. 7, just published by Burke & James, Chicago and New York, clearly demonstrates the remarkable progress of this enterprising firm. It is, in fact, a cyclopedia of photographic apparatus and supplies, stereopticons and magic lanterns, wherein every sort of working convenience for the photographer is clearly described and fully illustrated. With very few exceptions, all the goods listed are the exclusive specialties of Messrs. Burke & James and include many novelties not obtainable elsewhere, such as Etchine, a single-solution sensitizer for paper, cards, wood, silk, satin, linen and cotton fabrics; Rubinol, a magic agent which is at once an intensifier and reducer for negatives and a toning solution for Velox and other gaslight prints; Ten-in-One Mats, which make the handling and storing of thin films as simple as the handling of plates; and an ingenious tripod attachment which holds the camera securely at any angle, as is often desirable in photographing ceilings, flowers or other botanical and mineralogical specimens. No progressive worker can pretend to get along without this catalogue, which may be had on application to Burke & James, 118-132 W. Jackson Boul., Chicago.



At a recent meeting of the Photographic Society of Philadelphia, Mr. S. Stockton Horner urged several reforms which, he claimed, would materially add to the society's usefulness to its members. His suggestions, with which we are fully in agreement, were embodied in the following resolutions:

"*First*, That a committee give to the photographic press accounts of matters photographic pertaining to the society or to its members.

"*Second*, That the Lantern Committee be authorized and directed to select such slides only from sets submitted as shall seem worthy either by originality of treatment or of subject to engage the attention of the society; such slides to be shown at the Stated or Visitors' Meetings.

"*Third*, That the Members' Meeting be devoted ex-

clusively to short talks or papers by members on technical photographic subjects, and that every member of the society be expected at least once a year to give some item of information bearing upon the laws of light or upon photographic technique.

"*Fourth*, That at the Visitors' Meetings, as nearly as possible, lectures bearing only on photographic subjects be given."

There can be little doubt but that, if these resolutions were generally discussed and adopted by the majority of our camera clubs, amateur photography in America would receive a much-needed impetus.

At a later meeting of the society, Mr. Horner put one of his suggestions into practical operation by giving an instructive talk upon "Mounting and Finishing Exhibition Prints." He illustrated his remarks with prints selected from his own exhibition on the walls of the society's rooms. The address awakened an interesting discussion. Mr. Chas. R. Pancoast followed with "Some Mechanical Aids in Photographic Manipulations," exhibiting an ingenious box, of his own invention, for holding bromide paper. He also warmly commended the Wynne Exposure Meter as a practical help in determining exposures. Afterward Mr. Samuel Sartain exhibited some remarkable examples of color photography made by a new method patented by Miley & Son, of Lexington, Va.



Simeon Trenner, 3243 N. Carlisle street, Philadelphia, advises that he has secured the sole American agency for Ross lenses, microscopes, etc. For some months Messrs. Ross, Ltd., have not been represented in this country, and we have had many inquiries from readers concerning their Homocentric lens and other specialties. Those interested can now obtain information or price-list by addressing Mr. Trenner as above.



A few days ago we had occasion to make six sets of platinotype prints from ten different negatives. The time limit admitted of no failures—every print had to be reasonably good. With plenty of sunlight and a Wynne Print Meter we succeeded in obtaining the sixty good prints desired between noon and sunset, the Print Meter rendering the detail of exposure practically automatic.

Postscript to No. 26 The Photo-Miniature

Under this heading will be published occasional postscripts to earlier numbers of The Photo-Miniature series, giving new or supplementary information. — [EDITOR]

THE PRESENT POSITION OF TELE- PHOTOGRAPHY*

Telephotographic lenses have now been before the photographic world long enough for a just estimate of their practical value to have been formed, and the following remarks are intended to summarize the experience of more than a dozen years of intercourse with workers in the field of telephotography. It is unnecessary to deal with elementary principles, or to give working instructions here, for telephotography has now a literature of its own, and the beginner will find reliable guidance in the books of Mr. Earnest Marriage, the late Dr. Deller, in addition to the booklets issued by the manufacturers of the necessary instruments. Ten years ago the telephotographic lens was regarded as a scientific curiosity, which might have its uses, but that these uses were so limited, and the manipulations of the instrument so difficult, only the most ardent and skilful enthusiast dared to invest in one; today it is usually due to financial considerations if the amateur's outfit does not include one, while, more wonderful still, even the professional photographer is beginning to become conscious of their existence and to realize that there is money in a lens that enables him to accomplish work which he would otherwise have to refuse as impracticable.

We can only compare the progress of telephotography with that of the phonograph, which has in like manner developed from a scientific marvel to being a source of enjoyment to the million and an instrument of real value to the scientist and historian. I will now, with your permis-

*A paper read at the British Convention, Derby, July, 1904.

sion, give you some reasons why people use telephotographic lenses.

The greatest and almost sufficient reason is that they allow of objects being taken from a better point of view than is usually the case, the size of the image being at the same time capable of variation between very wide limits. (This was well illustrated by the two slides shown, taken from illustrations published while the telephoto lens was a struggling youngster and showing St. Albans Abbey as photographed from a near point of view, with all the horrors of exaggerated perspective, and the same building taken at a distance of nearly a mile, of course with a telephoto lens. Here the true proportion of the Abbey towering above the surrounding buildings was seen, and the intentions of the architect are truly recorded. Almost similar was the case illustrated by Mr. Cleveland's view of Salisbury Cathedral, only here as a contrast the rendering was given by an ordinary lens at the same distance.)

Taking another case, we may find that our desired object is entirely inaccessible and that the only possibility of securing a picture is by the use of the telephotographic lens. Architectural details may be classed with the foregoing, and I am glad to say that the student of architecture has not been slow to avail himself of the new power. One of the most recent developments of telephotography is its application to the rendering of very near objects sometimes on a slightly reduced scale, and again sometimes larger than natural size. Any one who has had experience in the photography of flowers, articles of jewelry, and the like, has felt the urgent necessity for a lens of such focal length that a comparatively distant standpoint can be chosen. The charming studies by Mr. H. T. Malby illustrate this.

From such subjects we turn naturally to portraiture, and it is gratifying to be able to record a growing tendency to use the telephoto lens in one or other of its forms in the studio. Besides the simple uncorrected telephoto lens which was made at the instance of Mr. J. S. Bergheim, negative attachments of low power are frequently used for what are commonly called studies, but which it is to be hoped will become the usual thing in the near future. Work by Mr. Hewitt, Mr. Cadby and Mr. F. H. Evans illustrates in a most striking manner the value of the telephoto lens in ordinary portraiture. A few words regarding the choice of a telephoto lens may not be amiss. Telephoto lenses may be roughly divided into two classes—high power, i. e., having a negative lens with a focal length of less than one-half that of the positive lens, and the moderate power, in

which the negative focal length is one-half that of the positive lens, or even greater.

Broadly speaking, it may be said that the high power combinations are mostly useful for mountain scenery, architectural details, and all subjects where the maximum magnification obtainable with any given camera extension is desired. The principal drawback to their general use is that ordinary-sized plates are not covered to the corners with low magnifications.

Moderate power combinations have in every sense a wider field. They are the tool of the pictorial worker, covering, as they do, the normal-sized plates with a minimum magnification of about three diameters—(by normal-sized plates I mean the size for which the positive lens was originally chosen)—and this at practically the infinity focus of the positive lens. With most modern cameras magnifications up to $4\frac{1}{2}$ or 5 diameters may be obtained, and this degree of enlargement will be found ample for most subjects. For portraiture, the focal length of the negative lens may advantageously be longer, equaling or even exceeding that of the positive lens, and it may here be pointed out that owing to the softening effect which results from the combination of a portrait lens with a negative, the full aperture of the former may be used, so that a magnification of $2\frac{1}{2}$ to 3 diameters may be obtained with little increase of exposure as compared with the positive lens used alone and stopped down sufficiently to get an apparently equal amount of depth of focus. In eight years the telephoto lens will attain its majority as a practical working tool, and I trust—I may almost promise—that I shall then be able to chronicle further developments in its construction and use.

T. R. DALLMEYER, F.R.A.S.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

AUGUST, 1904

Number 65

Home Portraiture

BOOK I: WRITTEN FROM THE PICTORIAL VIEW-POINT

Portraiture, whether at the home or the studio, seems to be, for one reason or another, rarely attempted except by professionals, and the mass of amateurs at the present day are, as a rule, utterly unconscious of the possibilities within their reach. In the case of landscape work the distinction between the productions of amateurs and those of professionals has been practically, if not wholly, obliterated; and especially now since the bands of amateur photographers that overran the country, aiming their cameras at everything within range, are gradually giving way to the more serious workers, who approach their subjects with some idea of picture-making. There would seem, however, to be almost a tacit understanding that, except for casual snap-shots, the amateur would do well to leave the field of portraiture entirely alone, so seldom do we come across any efforts in

this line at all comparable to the highly creditable results in landscape work that are commonly to be seen at our exhibitions.

A Misunderstanding Through either ignorance or indifference, there seems to be among amateurs a total misconception of the scope of the camera so far as they are concerned, and they attribute the feebleness of their occasional efforts in the line of portraiture not alone to the fact that they have had no training in the mysteries of the craft, but also and more especially to their lack of sky-lights, head-rests, screens and the rest of the complicated accessories associated with the portrait studio. But from the time, years ago, when Mrs. Cameron in England, with little technical knowledge and the simplest of outfits, made portraits that even today rank with the best of their kind, down to the present when some of the greatest successes in professional work have been made by amateurs who have gone into it untrammelled by professional traditions, it has amply been proven that neither elaborate accessories nor an initiation into any secrets of the trade are necessary.

The Studio Outfit Unnecessary An ordinary view-camera of reasonable size and a cheap lens of the all-round variety are amply sufficient as tools for the beginner; the modern house offers a variety of backgrounds and as much light as is in any way necessary; while common-sense and a gradually growing fund of experience are admirable substitutes for a larger technical knowledge with its tendency to lead the photographer into ruts and to prevent

him from experimenting for himself in fresh directions. What is, however, and what has always been necessary for success in home photography, is the willingness to bring to the task care and patience, unremitting labor and dogged perseverance, combined with true enthusiasm and love for the work.

The Measure of Success In photography, as in most other pursuits, there is no royal road to learning, and the achievement of the average amateur depends almost wholly upon the strength of what he desires to accomplish and, consequently, upon the amount of the endeavors that he puts forth. The trouble is that he rarely has the slightest conception of the hard work that goes to the making of a good photograph. Labor-saving devices are pressed upon him from every side, and he finds it so easy to turn out prints of a certain order that he rarely thinks it worth while to trouble himself further.

The most exasperating individual the serious photographer can meet is the amateur who, because he rarely, as he expresses it, loses a film, thinks it unnecessary for him to try to do anything better. He will display to you, with pride, the crudest attempts at picture-making, saying with conscious modesty, "Of course I don't pretend to be a professional photographer," and it is as a rule a thankless task to try to explain to him that his opportunities for good work are far greater than those of professionals, who are only too often bound down by the exigencies of their trade.

**Amateurs
versus
Professionals** A professional is hampered in a thousand ways, and even when he works according to his own desires he labors under great disadvantages at the best. People whom he has never seen before come to him, one after the other, and he is expected, in the extremely limited time at his disposal, to portray them at their best. Moreover, no matter what ability he may display in dealing with his difficult task, his efforts are often rendered of no avail by reason of the nervousness and self-consciousness of his clients; for the disinclination that many feel toward having their pictures taken and the sense of constraint that results from being placed, as it were, on view, are always intensified amid the unfamiliar surroundings of the studio. The opportunities of the amateur for obtaining a natural and unstudied picture are, manifestly, far greater than those of the professional, and the fact that the crudest snap-shot is apt to be so characteristic a likeness as to fill the friends of the victim with a fearful joy, only shows what might be accomplished by the amateur in the direction of portraiture were he willing to devote more perseverance and intelligence to the work.

**Mistaken
Notions** Unfortunately, perseverance and intelligence are, as a rule, the last things that the amateur thinks of applying to his efforts; for the careless hit-or-miss manner with which his work is carried on is due usually to the persistence with which some totally false ideas in regard to photography still cling to the average mind. For example, a general impression seems to prevail that the camera cannot

lie, and this opinion is stoutly maintained by many, even in the face of the libels upon nature perpetrated daily by photography. For the camera *can* and *does* lie in every conceivable way, and from the distortion by means of the lens or of the tilting of the camera, down to the falsification of color values in the print, it is only by the exercise of the greatest care throughout the whole process that the photograph can be made to convey to the mind an image that is at least comparatively truthful.

An equally false, though equally persistent, impression is that the sun does all the work, and that one may, therefore, develop a plate or print on the plan of bringing to light a concealed image; just as one would pour chemicals on a communication written with invisible ink in order to decipher it. This is one method, certainly, of accomplishing the work, but that it is neither the only nor the more desirable way is, as a rule, a matter of complete ignorance to even those amateurs that do their own developing and printing. It is difficult to force upon them the realization of how the materials with which they work may be made subservient to their will; and the trouble and care which a serious worker will bestow upon the making of a single print, for example, is a revelation to them.

There are many amateurs, of course, that have neither the time nor the money to devote to such work, and they may, without question, obtain a great amount of pleasure from merely mechanical methods, or from passing on their developing and printing to some one else. All that is to be de-

plored in such cases is the fact that the button-presser thinks that he has in reality made the picture and that the finishing up, as he terms it, is an equally easy and relatively unimportant part of the work.

The Way of Success Those amateurs, however, who really care for photography and who are willing to devote themselves seriously to it as a pursuit, must realize that the exposure of the plate is only the beginning of a series of processes, each one of which must be carried on with skill and care if the resulting picture is to be in any way a success; and that from the preliminary choice of the subject down to the very mounting, there is not a single stage in the proceedings which may be considered mechanical and entrusted to any one else without a distinct loss in the result.

Training Essential Success is, of course, at best a relative term and one admitting of countless shades of signification. To make photographs that would rank as pictures, there is necessary, as a rule, the same training in the fundamental principles that underlie the creation of any work of art, as would be required for the making of pictures in any other medium. For the photographer, as for the painter, there is necessary a knowledge of the laws of composition, of the massing of light and shade, of the suggestion of color and texture by the correct preservation of values.

Good taste, however, and artistic feeling may often act as acceptable substitutes for mere technical knowledge, for in photography the training

of the hand is of advantage only because of its undoubted effect in the education of the eye, and pleasing photographs may be made by people utterly ignorant of the natural laws that have in reality guided them.

**Picture
versus
Likeness**

Moreover, in portraiture it is unfortunately the case that an artistic picture and a good likeness are by no means always synonymous. Very beautiful effects may be produced that are either totally uncharacteristic of the subject of the picture or that present him in so unflattering a light that the case is even worse. If, however, the chief aim of the photographer be invariably to obtain portraits characteristic of the people at their very best, artistic training cannot fail to be an advantage to him, and the greater his skill the more pleasing as well as the more truthful will be the result. By an untrue rendition of color values, for example, the entire picture may be falsified and the likeness utterly destroyed, while an attractive composition and arrangement of lines will often lend beauty to a picture otherwise commonplace. The dissatisfaction often voiced of late years in regard to what is known as artistic photography is usually due to the fact that many of the pictures in question are really anything but artistic, copying as they do, perhaps, some of the mannerisms associated with the photographs of a true artist, but lacking the qualities which formed the basis of the real worth of the pictures.

Equipment

The amateur may as well dismiss from his mind at the outset the totally erroneous notion that his success would be

increased by the possession of a portrait-studio with its usual appurtenances of skylights and model stands, backgrounds, screens and all the other well-known accessories of the professional. Even the regulation camera, with its so-called portrait lens and adjustable stand, may well be dispensed with and the simplest of view-cameras with an ordinary tripod substituted for it. This doing away with elaborate paraphernalia is merely another step in the same line of progress that has brought about the modern studio with its single slant light and simple backgrounds, in the place of the old-time "gallery" with the flood of light from overhead, the painted scenic backgrounds, its head-rests, and, above all, the papier-mâché vases and cast-iron furniture which were manufactured especially for the purposes of the photographer.

Nothing more fully exemplifies
About the Background this change than a comparison of the backgrounds in use today with those of perhaps ten years ago. Even a cursory glance at the photographs in the show-cases along Fifth Avenue will reveal an almost unbroken sequence of plain grounds in solid tints ranging from light to dark, the particular tone being to a great extent determined by the fashion of the moment. A year or so ago most of the backgrounds were very dark, so that the lines of the figures faded into them in what was termed a Rembrandt effect; even the faces of the subjects being thrown correspondingly into shadow, with only a few brilliant high lights spotting them here and there. At the present time the taste seems to run to very light backgrounds, which

it must be said present a much more cheerful appearance. Together with these plain backgrounds there is a marked absence of any accessories in the surroundings, even the inevitable chair with the high, carved back having succumbed to the march of progress.

Avoiding Monotony This doing away with the artificiality of alien surroundings is an undoubted advance over the preceding methods, and the simplification of the whole picture is at all events never objectionable. But, notwithstanding that it is better that the backgrounds and accessories should be lacking in interest rather than that they should strike so false a note as to throw the entire picture out of harmony, still the monotony of the result is in such a case inevitable, and the photographer himself is deprived of what should be some of his most valuable aids in composition. But there is only one way to obtain surroundings that are not meretricious, and that is through the portrayal of people at their own homes. Unfortunately, it is not until the professional can command far higher prices than are usual at the present time that he can afford to devote himself to this line of work; but for that very reason this rich field remains almost untilled for the amateur to cultivate. The obstacles in the path of the professional are in the case of the amateur almost wholly absent. Time and hard work are the only essentials for the task, and, as far as expense is concerned, if the amateur will only devote to the working out of a single composition the same expenditure both of money and of energy that

he is accustomed to scatter over numerous efforts, he will find himself amply repaid.

**Amateur and
Professional
Methods
Compared**

Portraiture at home is undeniably more difficult than studio work, but to its votaries it is just as undeniably far more interesting. The two kinds of work, moreover, are so entirely different in every particular that the amateur will find himself only hampered by any study of the methods of the professional. The latter works day after day in the same room and learns to know its possibilities in the way of lighting so thoroughly that he has to experiment very little in order to produce the effect that he has in mind. He soon ascertains what he considers the correct length of exposure under such conditions, and he is thus enabled to turn over the developing of the plates to an assistant, who can soon be trained to produce negatives of whatever quality is desired. The retoucher then takes his turn, although he probably has never seen the subject of the picture ; for retouching, of any elaborate nature, is a trade in itself and requires both a special training and constant practice. With negatives alike in quality, the printing is more or less mechanical, so that it also may be entrusted to a subordinate, as well as the mounting. It is useless to complain that the result lacks individuality, for under such conditions what else could be expected? Photography is rarely a lucrative profession at the best, but if the photographer carried on by himself all the departments of his establishment, he would be able to take in only a very small amount of work ; and with the present scale of prices the

result would be that he would receive only about the same salary that he at present gives to one of his assistants.

The Amateur's Advantages With the amateur the whole case is entirely different. In the place of dealing with a series of conditions varying little from day to day, he finds himself at the beginning of each composition face to face with a fresh problem. Instead of being able arbitrarily to arrange a background and lighting to consort with his idea of the subject, his task is, with comparatively slight modifications, that of dealing, as best he may, with what is presented to him. Choice, arrangement, elimination,—all these, however, are open to him, and the possible combinations of the elements of each picture are so varied that far from finding the process simplified, the photographer soon is forced to realize that the complexities are greatly increased, and that the unification of the diverse factors into a harmonious whole is a task that calls for the utmost nicety of judgment and for the most complete display of whatever artistic skill he may possess.

Some Difficulties Working under constantly changing conditions, he is less apt, it is true, to fall into a rut than can be any photographer who is accustomed to work day after day in the same surroundings; but his difficulties are of course intensified by his lack of familiarity with the possibilities of the rooms which he uses. The variation in the lighting makes it impossible to time the plates uniformly, especially since in portrait work the length of the exposure must be decided not by what the pho-

tographer would desire but by what the exigencies of the case may allow. For that reason, if for no other, it would be practically impossible to permit any one else to carry on the developing and the printing, unless the photographer were completely indifferent as to the artistic qualities of the result. In any case, however, the developing and printing are recognized by all pictorial workers as factors of just as much importance to the picture-making as are the composition and the exposure.

Hard work, therefore, is the first requirement for entering upon the precincts of home portraiture; and if to this be added common sense and perseverance, three of the most valuable aids to success are at once assured. The only way to know how to make good portraits by photography is by actually attempting the work. Some few suggestions based on the experience of others may be of value to the beginner; but unless these are tested practically they are apt to make little impression, and a few hours of concentrated labor with one's camera are worth more than days of reading.

The selection of the outfit is a comparatively simple matter. Some of the most beautiful pictures have been produced with a home-made camera and the cheapest of lenses, but there is no reason why the beginner should not take advantage of all that modern invention has put in his way and leave to the past master of the art the task of showing the public that it is the intelligence of the worker and not the camera or the lens which is responsible for the result. But while it is desirable that

the beginner should not be hampered by inferior tools for his work, still, in making his selection from the innumerable goods on the market he would do well to be certain that the most expensive are in reality best adapted for his purposes before laying in a supply of them.

The Lens

In the case of the lens this is especially to be noted, for those that are usually considered the best of their kind are celebrated for their extreme power of definition, a quality always to be avoided by the pictorial worker. This does not mean that the lens should not be clear and free from distortion, but merely that it should be sufficiently soft to lend to the image a certain diffusion or atmospheric quality even while it is still completely in focus. This sense of diffusion is entirely different from the "fuzzy" quality resulting from the picture being out of focus, and it is usually lost in the process of stopping down, so that it is very important that the lens should possess such flatness of field as fully to cover the plate when used at its largest aperture.

Hand-Camera

Lenses

Unsuitable

The small lenses that come with hand-cameras are ill adapted to the work, for at their best they have only the effect of a larger lens stopped down to its smallest aperture. They make everything within range unpleasantly hard and sharp, and the better the lens is supposed to be the more sharply is it supposed to bring everything into focus. A lens of this kind acts as a sort of combined magnifying-glass and telescope, and its owner will often tell you proudly that it

will delineate each blade of grass or each leaf upon the tree, though they be quite indistinguishable to the naked eye.

These small lenses are seldom quick enough to be satisfactory for home portraiture, for it stands to reason that the larger the working aperture of the lens, the more light comes through it to the plate and therefore the shorter may be the exposure—an undeniable advantage.

The Portrait Lens The very large rapid portrait lenses are, on the other hand, not only quite unnecessary but also undesirable. Though they are undoubtedly rapid if used at full aperture, they can rarely be so used owing to their shallowness of depth of definition, and they have to be so stopped down in order to bring the various planes of the picture into focus, so that a smaller lens might just as well be used at the outset. Then, too, their size and their focal length make it necessary to use them with a large studio-camera on a stand; for even were their weight not too great for a portable camera they require a much larger bellows than is usual. A good lens to be used with a $6\frac{1}{2} \times 8\frac{1}{2}$ view-camera is what is known as an ordinary, all-round anastigmat, about two inches in diameter and twelve inches in focus. Such a lens ought to work at an aperture of at least $f/6$, so that even if stopped down to some degree it can be used with about one second exposure in the ordinary house.

Cameras As far as cameras go, the choice is not very difficult. Any good make will suffice. The camera must, of course, be used on a tripod and have a ground

glass focusing screen, a finder being useless in any serious work. In size, $6\frac{1}{2} \times 8\frac{1}{2}$ will be found to be about the best that is practical. An 8×10 camera is very heavy and unwieldy to carry around, and, though some men are able to manage that size, they are almost impossible for women. Anything smaller than $6\frac{1}{2} \times 8\frac{1}{2}$ will be found out of the question, for, although a 5×7 plate may occasionally be used for head and shoulder pictures, they are far too cramped for serious compositions and group portraiture.

Accessories A firm tripod, a shutter, a focus-
Plates ing cloth, a stout carrying-case and as many plate-holders as it will admit, complete the outfit. Eight double plate-holders will usually fit into the case, and they are none too many to carry. It is well to have them fitted with aluminum film-sheaths, so that cut-films may be used when desired instead of plates. Films are much lighter than plates, and they can, moreover, be shipped about without fear of breakage, but they are rather more trouble to develop than plates, so that the advantage of using them must be determined by the distance that the camera has to be carried.

Begin at The beginner will do well, as a
Home rule, to start in his own house and exhaust its possibilities and those of the models he has at hand before venturing upon more unfamiliar fields, with the accompanying necessity of displaying the results of his endeavors to outsiders. As to the firmly implanted idea that an ordinary house does not offer sufficient light for the purposes of the photographer, the only way to break

it up is for him boldly to go to work and prove for himself its falsity. Some effects, of course, can be obtained more readily by a skylight, but the flood of light it admits is utterly destructive to the exquisite modulation of the tones, the luminosity of the shadows, and the atmospheric quality that are the delight of the home worker.

After the photographer has decided upon the subject for his picture the choice of the background is the first consideration. This choice, however, must be to a great extent determined by the source of the lighting and its effect upon the face of the model. The best way, therefore, to decide this point is for the photographer first to choose the place where he would prefer, if possible, to take the picture, and then try posing the person there to see whether he finds the light available for his purpose. If he does not and if he cannot render it suitable by whatever changes are in his power, such as by drawing together or opening curtains or doors, by asking his model to turn successively in different directions and by moving the camera itself to correspond, he must abandon it in favor of another spot or another room. Then, if the most desirable lighting does not accord with a satisfactory background, he must either remove the objectionable features or, if that be not feasible, attempt to blot them out by placing the figure as far forward as possible and throwing the background out of focus. As a last resort, he may always introduce a screen covered with perhaps a shawl or drapery of some kind between the figure and any obtrusive elements in the back-

ground, but this should be avoided whenever possible, as it not only detracts from the naturalness of the scene but it is also apt to result in an effect which, even if it be unobjectionable, is wholly lacking in interest.

**Avoid
Studio Effects** It is greatly to be deplored that many workers in home portraiture make no attempt to make use of the characteristic accessories they find at hand, but attempt instead to imitate the plain tints of the professional by means of sheets stretched on clothes-horses and other devices. It is, of course, easily possible to err in the other direction and to render the picture confused and inartistic by an indiscriminating use of the overcrowded and unattractive interiors of many modern rooms. A beautiful house is, of course, an inestimable advantage to the photographer, especially when the beauty is that of extreme simplicity, but in any case, so long as the accessories may be made at all conformable to the lines and spacing of the composition, their total elimination is a great mistake. A study of the best paintings is a great help to the photographer in this connection. Some of Holbein's drawings, for example, show a background crowded with details, yet each so admirably arranged and so typical of the subject of the picture that their omission would be an infinite loss.

**Pictorial
Accessories** In the selection of both background and accessories the type of the person to be photographed must be carefully considered. One would, as a matter of course, make use of very different

elements in the case of a man or of a child, of a young woman in an evening gown or of a grandmother with her knitting. The influence of the character of the dress and surroundings upon the people themselves is also very apparent. A child in his party best, stiff and starched in the constrained atmosphere of the drawing-room, is very different from the same youngster at play in his nursery. Older people are no less exempt from self-consciousness; and the picture of a young mother, for example, bending over her baby would show an entirely different type of woman from one where she was dressed in a ball gown and seated on a Louis Quinze sofa. To realize which side of the character is most typical is a task for the photographer no less than for the painter, but the amateur has here a distinct advantage over the professional in that he has as a rule at least an acquaintance beforehand with the subjects of his pictures, and thus can both more readily judge of the circumstances under which they appear most characteristic and also avoid anything that seems forced or alien.

**The Question
of Dress**

The amateur, moreover, has another advantage in the fact that he can usually please himself in the choice of the costumes and the details of the picture; but he is, unfortunately, all the more apt to be lured into the pitfall of over-arrangement and manipulation. He is apt to think that no picture can be artistic unless his models are dressed in the costume of some bygone period, and he creates a totally artificial atmosphere under the impression that by so doing he has made the picture, and that

all that is necessary is to focus his camera and secure it. But costumes and surroundings, quaint and beautiful though they may be, are only minor elements in component parts of the picture, and unless the photographer bestows upon such a subject the same skill and care that he would give to any other, the bold presentation of the scene is apt to be even less interesting than if he had confined himself to a representation of every-day facts.

**Avoid
Fantastic
Effects** For, since it is impossible for the photographer, like the painter, to change undesirable details, as his fancy prompts him, and also to transfigure the whole scene by his imagination, any inharmonious elements are apt to be unpleasantly obtrusive. Moreover, since people in looking at a photograph know that the camera was able to reproduce only what was actually before it, their attention is apt to be diverted from the effect of the picture, as a whole, in their desire to note the various accessories that were utilized in its composition.

When a photographer once begins to tamper with the actual fact he must move with extreme caution, lest he be betrayed into anachronisms of the worst order. And even if he steers clear of any actual mishap, still it is a question whether he has not lost more than he has gained in making the attempt. For the great charm of a photograph lies in its exact delineation of life and nature, and the fact that it is known to represent only actual objects lends it a sincerity and an atmosphere of reality that is one of the greatest ambitions of the painter to achieve. These natural

objects may be emphasized, or suppressed, or eliminated, just as the artistic requirements of the composition may suggest, and the value of the photograph, as a human document, is only heightened by the skill of the photographer who may know how to accentuate in the picture just the effect that he desires, and to suppress all the details that might distract the attention.

The Natural Pose Just as the photographer should refrain from any too obvious tampering with the arrangement of the background, so too he should strive to utilize the natural poses of his subjects rather than have them assume certain attitudes or positions to fit in with his preconceived ideas on the subject. In portraiture, as contradistinguished from purely pictorial work, it is nearly always impossible to determine beforehand any exact composition; for no matter how well the lines may balance and no matter how interesting the arrangement may seem from an artistic point of view, unless the person photographed falls naturally into the desired position, the attitude is invariably stiff and constrained. At best, the photographer can make suggestions only as to minor changes, and, while striving to influence his subjects as little as possible in regard to pose or expression, be constantly on the alert to take advantage of what chance may throw in his way.

The Limit of Arrangement The amount of arrangement and the length of time possible to be consumed during the work varies so materially with different subjects that this can be determined only at the time. If the people seem

interested in the operation and anxious to lend themselves readily to the furtherance of the most successful end, the photographer may often take advantage of their willingness and spend a long time in trying different effects before making a decision. On the other hand, if his subjects seem at all nervous or self-conscious it is well to proceed as quickly as possible, for whenever it is necessary the attainment of an artistic composition must be sacrificed without hesitation to that of getting a good likeness.

The Problem of Lighting The necessity of keeping always in view the requirements of the subject of the picture is one of the chief differences between portraiture and other classes of work. It is impossible thus to study out beforehand any system of lighting, for each case must be determined solely by its own needs, and until the model is placed tentatively in different positions and the whole effect carefully regarded, no decision can be made. The photographer may, of course, start out with certain preconceived ideas based on what his experience has shown him. For example, he would know that if his subject possessed fair hair and blue eyes he would do well to try to use a dark background in order to give sufficient contrast to the hair, and he would try to throw the eyes into shadow by concentrating the light from above and behind; but it might happen that if the features were very sharp and the cheek-bones, for example, unpleasantly strong and high, he might have to modify his lighting in order not to throw these features into undue relief.

**The Disregard
of Convention**

Many of the time-honored conventions in regard to the lighting may be disregarded entirely by the photographer, to his great advantage. Because painters insist on having a north light, it does not follow that this is necessary for photographers any more than is the skylight usually to be found in the studios of both. The north light is valuable for the painter, because, owing to the fact of the sun's appearing to move steadily across the heavens, the difference in the lighting in any room where the direct rays of the sun enter is very marked during even a comparatively short space of time; and, as the painter requires hours if not days for the completion of his work, a steady light is a necessity for him. But the length of time required for the exposure of the plate is so short that the change in the sun's position is imperceptible, and even during the arrangement of the picture the variation in the lighting may be entirely disregarded.

**A Skylight
Unnecessary**

The use of the skylight is also more valuable to the painter than to the photographer, for the reason that the painter requires the canvas upon which he is working invariably to be well lighted. His model, indeed, may be in semi-obscurity, but the canvas must always be in approximately the same glare of light that it would receive when hanging in a modern exhibition. To the photographer, on the other hand, so long as his model is lighted adequately, it makes little difference where his camera is placed, as whatever illumination is on the subject is transmitted through the lens to the

ground-glass or plate, and the only thing necessary is the avoidance of pointing the lens toward too brilliant a light and thus fogging the plate. But even this fogging may be overcome by a judicious placing of the camera, for even an open window may be used as a background, provided that the light entering it at the time is not too strong, and provided also that there are other windows in the room so that the figure may be sufficiently lighted from these sources as not to present the effect of a silhouette.

**Sunlight
Effects**

It is a great mistake always to avoid a sunny room for photography or to screen the windows invariably with cheese-cloth shades and curtains, as is sometimes advocated. The sunlight effects are often charming and the photograph may be taken directly through the rays of the sun with perfect safety. Or, if this is not desired and the model is placed out of the range of the sun itself, the same lighting can be obtained as by any other window, except that the light is usually much stronger and a shorter exposure frequently may be utilized. The length of the exposure, indeed, may modify any degree of lighting, and if, in addition, the photographer develops his own plates, he will have two valuable aids in obtaining almost any effect of lighting that he has in mind at the time of the taking of the picture. For example, if an excellent background and general composition would seem to be afforded by a position near the only window contained by the room, and if the light coming from this single source appeared to illuminate one side of the face too strongly, leaving the other

completely in shadow, a somewhat lengthened exposure of the plate would tend to equalize the contrast. Or, if this prolonged exposure were not at the time practicable, much the same effect might be obtained in the development by increasing the amount of the alkali and the water in the developing solution and keeping the plate as thin and flat as possible.

Exposure The exact length of the exposure can be determined only by experience, but a safe rule is never to under-expose if possible. Much less light, however, is needed than is usually believed to be the case by those that have never tried home photography, and comparatively short exposures may easily be given, always provided that the photographer develops his plates judiciously. In most cases "snap-shots" will be found advisable, and by a snap-shot is meant an exposure of perhaps a half second or just time enough easily to open and shut the bulb of the shutter. Naturally one cannot give an exposure of this kind unless the subject of the picture be placed in a good full light, though it need be only such a light as can be found in any modern city house or apartment. There is no reason why quick photographs should not be made in even a fairly lighted room, but manifestly, if the subjects be children or people that require a very short exposure, they cannot be placed in a dark corner or in any spot where the light presents very sharp contrasts. The most generally suitable position for a subject of this kind is where the camera is placed with its back against the window and what light there is in the room is allowed to fall flatly

against the models; for the short exposures will give sufficient contrast to the plate. But if the room be in a country house or any place where the light would be considered good, greater latitude of position may be allowed and good results may be obtained even on a cloudy day.

When the
Light is
Poor

Leaving out of account the possible modifications of the photograph during the development and the printing, though these are by

no means inconsiderable factors in the whole process of picture-making, the photographer has two alternatives in arranging his composition; he may either utilize a strong light and so minimize the length of time required for the exposure, or he may prefer a dimmer light and trust by lengthening the exposure to obtain a normal result.

About
Movement

Of the two methods suggested the former is infinitely preferable, for even when not dealing with chil-

dren or with people whom it is difficult to keep still, it is inadvisable to help to produce any sense of rigidity or constraint such as is almost invariably produced by the knowledge of the necessity of remaining immovable for any number of seconds. The best way is for the photographer to strive to allow all possible freedom of movement up to the time of the very taking of the picture; and within certain limits this may be quite considerable, for if people remain in approximately the same position they may turn their heads or talk or write or sew without affecting the focusing to any great extent. In this way rigidity may be completely overcome.

An Important Advantage One of the greatest advantages of home portraiture is the possibility of representing the people photographed among their natural surroundings and in some characteristic attitude. All the little details of every-day life lend a charm to the picture and add immensely to its value in the eyes of the possessor. If they detract too strongly from the artistic quality of the composition the photographer will show his skill, or his lack of skill, according to his method of utilizing the material with which he has to deal. The speed with which all his decisions must be made forms the chief difficulty in his work, for, in addition to his attempt to make his picture interesting in lighting and arrangement, the portrait photographer can never for an instant lose sight of the fact that his first endeavor must be to succeed in getting a likeness of his clients, and a likeness that is not only characteristic but that represents them at their very best. He must study them until he feels sure that he has done all that lies in his power to bring out their best points and to conceal their defects. Here, too, the amateur finds his task simplified by reason of his previous acquaintance with his subjects and his consequent knowledge of the circumstances under which they seem most attractive or pleasing.

Securing a Characteristic Portrait The easiest way to obtain a characteristic and unstudied pose is for the photographer to encourage anything that may serve to occupy the attention of his clients and that may divert their interest from themselves. He should try to

observe them closely, while seemingly preoccupied with setting up his camera and arranging the various details of his composition, until some desirable attitude be assumed. If the photographer happens to be almost ready then to take the picture, they may be asked to retain the attitude assumed until the exposure can be made, or, better still, the photographer may strive to note the effect and then, when he is just ready, try to get the people to fall naturally again into the same position. Even though certain modifications may be found necessary, the main effect may usually be gained, and many difficult subjects who have found it practically hopeless to obtain a good likeness under ordinary conditions are assured by this method excellent results.

How Subjects Vary The very young and the old are usually the easiest to photograph, for in children the natural grace of youth atones for any shortcomings, while in the old the settled lines with their effect of repose and the dignity of age render the result nearly always attractive. Men are easier to work with than are women, for the reason that the strong lines of their features and their immobility of expression offer the photographer tangible points to seize upon. The most difficult class for him are the women whose charm lies not so much in lines as in coloring or animation, for unless these can pose easily and without self-consciousness it is very difficult for a photograph to convey an idea of attractiveness at all adequate. The gift of repose is one of the rarest qualities to be met with, but to the photographer it is, once found,

the greatest boon, and it atones more than completely in his eyes for much that may be lacking in the way of beauty. The favored mortals that possess this quality are nearly always assured of attractive pictures, and the reason for the saying that ugly people take better pictures than pretty ones is because they are usually less self-conscious. As a rule, the conventional type of beauty is less interesting to an artist than features possessed of more character and distinction, but even vivacity and beauty of coloring may be suggested in the photograph,—the former by a sense of arrested motion, which may be felt in a print just as in a painting, and the latter by a skilful management of the lighting and composition, and a correct preservation in the negative of what painters call values.

Groups Group portraiture is more difficult than that dealing with single figures, but it is also far more interesting. The compositions may be made more elaborate, and yet there is less need for invention on the part of the photographer by its being necessary to utilize only that which notably suggests itself. A group of children at play, for example, would arrange themselves naturally, and the photographer need modify their positions only to such extent as may be absolutely necessary for the requirements of the composition. With older people that display more self-consciousness the effect is less stiff and the artistic quality of the picture enhanced by having some one central point of interest for them all, even if they are only arranged around some one member of the group, like an old person

or a baby. In group work it is well to keep the background and surroundings exceedingly simple, for the eye is sufficiently distracted by the complication of interests owing to the inclusion of so many people in the picture that accessories must be used with extreme care, or the resulting composition will be a series of meaningless spots. With a single figure, on the contrary, an elaborate arrangement may be made to lead up to the central point of interest—the head or the form of the subject, and the common custom of placing the head directly in the center of the plate is as unnecessary as it is awkward. A study of paintings is the only way of overcoming this habit, and the effect of any arrangement should be considered framed in upon the ground-glass before any decision can be made.

**Emphasis
and
Suppression** It is only by focusing carefully upon any composition that its possibilities can be tested, for what may look well to the naked eye may be seen to be quite unsuitable when viewed through the lens. In focusing, too, certain parts may be emphasized and others suppressed; and the judicious use of the stops is one of the most important points. The only suggestion in this regard that can be made to the amateur is for him never to use a smaller stop than is absolutely necessary for the inclusion of what he wishes in the picture. In the case of using the lens at anything but full aperture, it is well to throw the focus away from the figures included,—that is to focus on something either before or behind them, and then when the stop is inserted they will

be sufficiently in focus, but the definition will not be so painfully hard and sharp as would otherwise be the case. Each successive stop not only takes away from the atmosphere of the picture but also adds to the length of the exposure, so, although they may be found a valuable aid in some emergencies, still they must be used with extreme care.

It is rare that a house picture is over-exposed, for even by using the fastest plates the longer the time that is given the better, as a rule, is the result. The color values are rendered far more correct by prolonged exposure of the plate, and it is much easier to get the effect in this way than it is in the developing. Since, however, it is nearly always impossible for the photographer to give as much time as he would like, owing to the fear of constraining his models by keeping them so long in one position, the next best thing is to bring up the plate by careful developing. A well-arranged dark-room is the first consideration. The practice of so many amateurs of developing in a bath-room, imperfectly screened from the light, or in an ordinary room at night by the aid of a sickly candle with a red shade of doubtful quality, is responsible for many failures. A perfectly dark but well-ventilated room and a lamp which gives the maximum of light that can safely be used are absolute necessities for any work the outcome of which is not dependent on chance; and now that nearly all the myriads of photographic societies have dark-rooms as conveniences for their members, there is no excuse for careless work.

**Development
an Important
Factor**

How to Do It Developing is something that can be learned only by practice. The various developing agents on the market are all of them good enough in the hands of any one who understands them, but in making a preliminary selection it is well to choose one that tends to flatness and lack of density, as for the short exposures in the house too great contrast is the chief thing to be avoided. By having the three component parts of the developer separate,—that is, the water, the alkali and the developing agent itself, the photographer can vary their proportions at will, and he will soon learn what his various exposures require.

How to Help Under-exposure By keeping the developer fairly warm, under-exposures may often be brought up, and the only danger to be guarded against is that of melting the film by letting the solution get too warm. This may readily be tested on any plate one does not care for, and the approximate degree of heat noted that can safely be used. It may be said that when the solution feels about tepid to the finger it is perfectly safe, and that the danger-line is reached when it feels warm, not to say hot.

Practical Points The developing is responsible for much of the artistic quality of the picture, for no amount of after-treatment of the negative or of dodging in the printing can compensate for a defective plate. And a plate is always defective if it does not produce the effect desired by the photographer, no matter how correct it may be from a technical point of view. By merely varying his method of develop-

ing, the photographer may take two plates exposed for exactly the same length of time on the same scene, and on one give the effect of a dark shadowy subject and on the other of a strongly lighted, clear, distinct one. For this reason it is futile to entrust the developing, with its power to make or mar, to another; and, even were it otherwise, the fascination of watching the image spring into life before one's eyes is too precious to forego. Either a few preliminary lessons in development or the careful study of some good manual will be of service to the beginner, but after that he must adopt his own methods and work out his own salvation by hardly-won experience.

**Finishing the
Negative**

After the plate has been fixed, it may be improved by reduction or intensification, by blocking out certain portions and working up others, or by any of the methods commonly employed.

Retouching

When it comes, however, to what is known as retouching, the amateur would do well to work on entirely different lines from those of professional portraiture. Retouching, as commonly practiced, is as destructive of all distinction in the picture as it is of the character of the subject, and the amateur should strive never to employ it except by way of remedying some fault which he was powerless to avoid. The pictures of children, of men, and of the old should never require any hand-work on the negatives except that technically known as spotting, and, even in the difficult case of women whose freshness of youth is past, the exaggeration of the lines may be avoided by keeping the negative flat and

thin and soft. In any case, what is known as "modeling" the features should never be practiced, and the only thing that is ever necessary is the removal of freckles or blemishes in the complexion and a softening of any deep lines or wrinkles which, owing to unskilful treatment either in the lighting of the subject or in the developing of the plate, have been made to assume undue prominence.

Retouching of this kind is very easy for any amateur to pick up for himself with a little practice, and it is exceedingly important that he should do the work himself. Unless he stood over the professional retoucher and directed every stroke, he could never have it done as he wished; and it is impossible for him to realize how little is necessary and how roughly the work may be done until he tries for himself. With the soft papers in vogue nowadays the pencil strokes never show as they would on the hard, shiny papers of former times, and a little brush work on the print will soften any marks that are too obtrusive. All that one needs for the retouching are a fairly hard lead-pencil, a fine brush, India ink, and a small knife, as well as what is called retouching medium and which can be bought at any supply shop. A single lesson or a study of any manual will be amply sufficient instruction; and the ease with which each man may be his own retoucher would not be insisted on at such length were it not commonly supposed among amateurs that their portrait negatives must be improved by being consigned to the offices of a professional. Far from being improved, they are

usually so completely ruined that his only chance is to perform what work may be absolutely needed for himself.

Making the Prints The printing is one of the most interesting parts of the whole process, and so infinite are the variations that may be made in the treatment of any paper, that different methods of printing offer an excellent chance for retrieving any errors that have been made in the negative. So many changes may be rung in even a single process by printing in different degrees of light, by varying the proportions and the temperature of the developing solution, by the quality and age of the paper used, and by so many other factors, that even after prolonged trials the printer rarely feels assured that he has won from the negative the very best result of which it is capable and he ceases, with reluctance, further experiments with it. The amateur has the advantage of not being forced to get out prints on time, and he thus can keep on experimenting in different ways and show none of his prints until he is ready, while the professional must send out his orders in a reasonable time and go on to fresh fields.

Trimming and Mounting The cutting and the mounting of the prints also offer endless ways of modifying or changing the result. Interesting compositions can often be obtained from seemingly hopeless plates by the judicious cutting of the print so as to exclude undesirable features and bring the picture into unity. Then, too, with the numerous mounting papers now on the market, the photographer may often change

the whole aspect of his print by his way of mounting it, for the tone of the papers near it will alter its appearance to a surprising degree.

Signatures The placing of the signature is a matter for great consideration, as it proves a valuable aid to the composition. The custom now obtaining of a free-hand ensignia or monogram, painted in water-color directly on the print, not only prevents the signature of the photographer from being lost in the case of the picture being framed, but adds a personal and distinctive touch to the picture. The utilizing of the signature as part of the composition is especially noticeable in Japanese prints, and so important is considered the exact placing of the signature that Japanese artists have been known to study for days the question of just where to insert it before they were able to arrive at a decision.

Conclusion The length of time required for the making of a photograph is of course immensely increased where the work is all carried on by one man in this way, and comparatively little can be undertaken. This in itself, however, is often an advantage, for it is only when the photographer is willing to give to the making of one picture the time and the pains that are usually devoted to the exposing of numerous plates that he may hope to achieve anything like success. The amateur, too, has the advantage of being able to make continually fresh trials with the same subject and so repair his previous mistakes, and the possibilities of any arrangement are so inexhaustible that the longer one works over any composition the longer, as a rule, he de-

sires to keep on working over it, until every detail be completed to his liking. In portrait work especially, where the tiring of one's subjects is a point always carefully to be guarded against, it is better to try at any one sitting very few variations of pose or arrangement, and concentrate all one's efforts toward getting just right whatever is attempted. The work is one that continually grows in fascination, and if any amateur will devote sufficient perseverance toward overcoming the technical difficulties that lie in his path, he ought very soon to be able to turn out portraits that can hardly fail to be a source of infinite satisfaction as likenesses, whether or not they rank as works of art in the eyes of the outside world.

MATHILDE WEIL.

BOOK II: WRITTEN FROM THE AMATEUR'S VIEW-POINT

To treat the human figure in a suggestive or pictorial way is undoubtedly a legitimate and very interesting branch of photographic work; but whatever interest or charm may attach to such work, it is not portraiture pure and simple. In picture-making by photography, of course, the subject must be so expressed as to bring out and make manifest the artistic thought or conception of the artist; but in the portrait, as commonly understood, the characteristic features should be clearly and distinctly delineated, the central idea of all portraiture being simply to give a faithful likeness of the subject.

Similarly, to introduce a figure in the charming scenes of home or social life, however pleasing this may be in its own way, is also not portraiture. In such circumstances the figure simply forms a point of interest in the pictorial composition. Rarely, therefore, do we find the harmonious combination of picture and portrait. In art, we instinctively demand unity—a central dominant idea. In the introduction of the human figure in any scene, the figure must be subordinated to the spirit of the scene portrayed, which spirit is the dominant idea. Obviously, in portraiture, the subject or person should be the chief point of interest. Further, it could only be by accident that a proper lighting of the subject could be obtained in an unconventional and chance scene.

These things are mentioned so that the reader may understand why pictorial portraiture is not considered in the following pages. My purpose is to plainly set forth those methods by which the amateur may attempt portraiture pure and simple. No suggestive or pictorial effects will be ventured upon; no scenic treatment will be advised, and even what are called accessories will be conspicuous by their absence.

It is not possible to teach any one how to make successful portraits by the written word alone. Neither industrial nor fine arts can be properly taught by books. These can only help to put the reader on the proper road. The traveling of the road is the personal — the really essential thing. After the brief instructions have been pondered, careful application and thoughtful practice must bring us to the goal we seek. With this caution, let us proceed:

Light The most profitable beginning which the amateur can make in home portraiture is to give thought to the broad question of light or illumination. A moment's consideration of the illumination given by a window in a room or on a veranda will tell us that the light is either harsh and glaring, or soft and mellow. The quality of the illumination will necessarily vary with the surroundings, and, of course, as the subject is placed near or away from the direct source of the light. For successful home portraiture, the light should always be of the soft and mellow kind, generally diffused, rarely falling abruptly upon the subject. Again, this desirable soft light may be divided into primary and sec-

ondary lights. The primary light is that which gives character and projection to the face, by causing more or less distinct shadows to the features. The secondary lights are those which blend these shadows into soft and transparent shades, giving gradation and modeling. To reiterate, in lighting the face, we must employ the stronger or primary light for the projection of the features, and the secondary, or weaker light, for blending the shadows into shades. If we employ a perfectly even, diffused illumination, we will get a photograph of the face without projection — flat and insipid in character. If we use the primary light alone, the photograph will have projection, but the features will seem distorted by reason of the heavy shadows. In the harmonious blending of these lights and shadows consists the whole art of portrait lighting.

From this it will be seen that a great deal will be accomplished in home portraiture by learning to discriminate with regard to illumination. A few experimental lightings with a model will tell us a great deal about this whole problem, its difficulties and their solution, without the necessity of making any exposures or wasting plates.

Let us take up the practical question: How may harsh and glaring lights be avoided, and soft and mellow illumination be had in home portraiture? As a primary light, the strongest that we may use in portraiture is that coming direct from the sky in a direction removed from the sun. This lighting will usually give satisfactory results if we can get the secondary lights sufficiently strong to

**How to Use
Light**

properly balance the primary lighting, i. e., to blend its shadows into transparent shades. If this harmony or balance between primary and secondary lightings cannot be obtained because of the intensity of the primary light, then we must reduce this by introducing a screen between the light source and the subject. In interior portraiture, where the light is necessarily dim as compared with that out of doors, the screening of the side light should seldom be resorted to. Generally in an ordinary room the problem is how to get sufficient light for our purpose. The reader is here cautioned that when we speak of soft and mellow lights, he is not to confound these with dim lights. The lighting may be soft, and yet be effulgent, that is, abundant and diffused. The more abundant it is, and the more skilfully diffused, the more satisfactory will be the results. We are not to attempt to cut down the light, but to keep it mellow, so that it will give us the proper gradation and balance of light and shade in the subject. A poor and dim light will always impress its poverty upon the photograph. In outdoor work, the fading light of eventide will often produce most pleasing effects, but this does not apply in portraiture.

If we note the contrasts or balancing of lights most pleasing to the eye in regarding the subject, and then make an exposure, we will usually get a photograph wherein the contrasts are less pleasing and more decided than they seemed to the eye in the subject. The reason for this is twofold ; in the first place, the higher and lower lights of the face

**The Increase
of Contrasts**

are robbed of a certain amount of light by the absorption of the lens; and, as the higher lights can better stand this absorption than the lower lights, the result is somewhat more contrast between the two on the ground-glass and in the negative. Secondly, the chemical inertia of the sensitive plate acts in a similar way upon the scale of gradation. These two purely physical causes unite to produce an increase of contrasts. For this reason, wrinkles and character lines in the subject are accentuated in the untouched negative, it being borne in mind that it is only from the contrasts of light and shade that we can see these wrinkles and character lines at all. The obvious lesson is to make our exposure when there is a little less contrast than is pleasing to the eye, trusting to the lens and plate to make up this deficiency. Of course, this applies only when the conditions will admit of normal exposure and normal development.

The Lens

The choice of a lens for portraiture calls for more attention than it usually receives from the amateur. The problem cannot be solved simply by the purchase of an expensive lens, or the mere possession of one of the modern anastigmats. A costly lens of the wrong sort may be much less suitable for portraiture than a very much less expensive lens of the right sort.

Importance of Focal Length

The first consideration is the focal length, not the back focus, but the equivalent focus. We are frequently enjoined to use a long-focus lens for portraiture, but the injunction does not carry

much weight with us, unless at the same time we are made to understand the reasons for the injunction. As a consequence, amateurs frequently employ a lens of too short focal length to give good results in portraiture. It will be profitable, therefore, to explain why we should use a long-focus lens in portraiture.

It is well known that if we make a photograph with a lens of any focus of a person quite near, and with his arm extended directly toward the camera, the photograph will present a monstrosity; the drawing quite out of proportion; the hand being enormous in proportion with the head and its features.

But if we look over the camera at the subject in the same attitude, our eyes will perceive no distortion. Why this difference between what the eye sees and what the lens sees? It is simply this: The image upon the retina of the eye is distorted, just as in the photograph, but the mind instinctively rectifies the distortion to correct the drawing. In the photograph, however, the mind refuses to correct the distortion truly rendered by the lens, which does not possess the wonderful power of accommodation peculiar to the human eye. The painter or photographer must, therefore, first get the proportions and drawing right before presenting his transcript to the eye; and the only possible way to get this in the photograph is to get back from the subject a sufficient distance to narrow the angle of view. Mathematicians tell us that in order to get absolutely correct drawing of the object, we must view it from an infinite distance; but we are not here dealing

with such extreme considerations. It is found in practice that a fairly proportioned drawing of a face may be had with the photographic lens at a distance of about six feet. A greater distance will, of course, give better drawing; but six feet will reasonably answer for most purposes in amateur portraiture. If the face is held vertical, and the nose is not especially prominent, a distance of five and one-half feet may be used; but to push the distance to only five feet will give a distortion noticeable to the critical eye. We must not forget that the very end of the portrait is likeness, and that likeness depends largely upon correct drawing. Even at a distance of six feet, in an average head, the ear will be represented at about 8 per cent out of proportion to the nose, but the more important features of nose, eyes and mouth will vary from each other only about 2 per cent, an amount of distortion which we may accept as inappreciable.

We know that we must not approach the subject nearer than six feet in order to get satisfactory drawing of the features. At this distance, with any lens, regardless of focal length, the image will be in the same drawing. Why, then, use a long-focus lens? Simply and only to get size, the size being in proportion to the focal length of the lens used — that is the scale of the subject within the size of plate used. If we would be satisfied with tiny photographs, that is, pictures wherein the subject is represented in a very reduced scale upon large plates, then we could use a short-focus lens: but if we want a fairly large image of any given subject on our plates, then we must use a lens of

correspondingly longer focus in order to secure correct drawing combined with the desired size of image. Thus, it will require about a one and one-half-inch head to properly balance in a half-cabinet oval portrait, and taking the average sized head of a person as about nine inches from the crown to the chin, by simple optical rules, we figure out that for six feet distance, a lens of ten inches focal length will be required. Of course an image of one and a half inches for the head can be secured with a lens of less focal length, but only by pushing the camera nearer the subject, which, as explained, will result in a larger degree of distortion in drawing or likeness than is permissible.

There is another excellent reason for the use of long-focus lenses in portraiture. In popular language, a lens of short focus gives greater "depth of focus" than a longer-focus lens used at the same distance from the subject. By this is simply understood that the short focus-lens will define objects nearer and further away from the camera than a long-focus lens used at the same distance. But this "depth of focus" is something we do not want in portraiture. When we focus on the tip of the nose or the eye, we prefer the ear and the back part of the head to be slightly out of focus. This gives us a desirable amount of roundness and atmosphere in the portrait, which will be lacking if a lens of short focus be used. Taking everything into consideration, we would advise the amateur to use a lens of at least ten inches focal length for portraits up to 5 x 7; twelve inches would be still better.

Speed of Lens The next thing to consider is the speed of the lens. The speed of a photographic objective simply expresses the largest aperture which will give good results, and we must remember that the amount of light reaching the plate is directly proportionate to the area of the aperture used, so that the speed and light power of the lens amount to the same thing. A consideration of the following points will show, other things being provided for, that the speed of the lens for portraiture cannot well be too great. First: the speed must meet the requirements of indoors, where the amount of illumination available is necessarily less than that of outdoors. Second: the lens should be able to give an adequate exposure in the least possible time, so as to enable us to secure a pleasing expression. This applies particularly to child portraiture. Third: within wide limits, the greater the light, i. e., the larger the aperture, the softer and more pleasing will be the portrait. Fourth: the larger the aperture, the less the "depth of focus," the advantage of which has already been pointed out. While, as said, the lens for portraiture cannot well be too rapid, yet the amateur must frequently content himself with an objective of moderate speed. He should, however, have one which can work as fast as $f/5$ or $f/6$.

The "Portrait Lens" We now know that our lens should have a focal length of at least ten inches, and a speed of $f/5$ or $f/6$. If the amateur has an anastigmat or a rapid rectilinear which will come under these specifications, he needs nothing better. If, however, he has to

buy a lens for portraiture, he can satisfy these requirements at less money than is needed for an anastigmat by purchasing one of the cheaper forms of regular portrait lenses. These are listed as costing from twenty to thirty dollars, but good second-hand portrait lenses may be had for a little over half of these figures. Whether you buy a new or a second-hand lens, buy it with the privilege of returning if not satisfactory after a practical test.

To test a lens scientifically calls for considerable skill and knowledge, but the amateur can get sufficiently accurate results in quite simple ways. Let us assume that you have secured a second-hand portrait lens with a rack and pinion, and with a slot for Waterhouse stops. If there is a slight scratch on the glass, this need not condemn the lens, such a defect being very much less hurtful than dirt when it is on the surface of the glass. First, to get the focus of the lens: Carefully focus upon an object one hundred feet or more distant, and then measure the distance from the ground-glass to the slot where the stops are placed. It will be quite near enough for our purpose to call this distance the focal length of the lens. Next, as to speed. It is not likely that the lens will give sufficient definition or sharpness at the full aperture, although it was presumably made to work that way. Lens-makers, especially with lower-priced goods, are prone to over-state their claims. Unscrew the front lens and carefully measure the diameter of the contraction of the barrel where the stops are placed. From a dark piece of cardboard, cut a circular stop about seven-eighths the diameter of

the measurement just secured, and place this cardboard stop in the slot as a temporary diaphragm. This will represent the greatest aperture to be used. Now divide the focal length (already known) by this diameter, and you will have the speed of the lens expressed in F values to a sufficient approximation. If the quotient is 5, then the speed will be $f/5$. If 6, then the speed will be $f/6$, and so on for any other quotient. As before admitted, the foregoing tests for focus and speed are not quite scientific, but they are abundantly so for practical purposes.

In order to test the definition and general performance of the lens, it will not be satisfactory to resort to the mere taking of pictures. You will need to be more mechanical. Using the cardboard stop, make a photograph of some distinct printed matter, seeing that the focus is sharp in the center of the ground-glass. Now carefully examine this photograph. Your lens, being for portraiture, will probably have been sold to you as covering a 5 x 7 plate; but if you find that it well covers a circle of four inches, as shown by the photograph, it will be satisfactory. You will need more than the four inches for standing figures; but in such cases you can get what you need by stopping down the lens; but much of your work will probably be head-and-shoulders portraiture, and this can be had within the four inches without the use of the smaller stops. If the definition is poor within the four inches, send the lens back. The reason that a photograph of printed matter is advised, is that if distortion exists you can readily see it. We will

Defining
Power

now assume that you have found the lens to be ten inches or over in focus, as quick as $f/6$ in speed, and that it will well cover four inches of the plate. With these findings you may accept the lens without bothering with any other tests.

Stops A few words about the stops: In the foregoing, a stop of about $\frac{7}{8}$ of the full aperture was directed. Mark this stop No. 1, and always use it when a smaller one is not employed. Make another stop of just $\frac{1}{2}$ of its diameter, and mark it No. 4. Make another just $\frac{1}{2}$ the diameter of No. 4, and mark it No. 16. Make another 71 per cent of the diameter of No. 1, and mark it No. 2. Lastly, make one 71 per cent of the diameter of No. 4, and mark it No. 8. You will now have a set of five stops, viz., No. 1, No. 2, No. 4, No. 8 and No. 16, and the number of each will precisely represent the relative times of exposure. Thus, No. 2 will call for twice as much as No. 1; No. 4 will call for four times as much as No. 1, and twice as much as No. 2, and so on with the remainder. Of course, in this system of marking, we entirely lose all sight of the f values; but we can well agree to do this, as in our everyday work we are only concerned with the values of the stops as between themselves. If, for an occasional purpose, we want to know an f value, it is but little trouble to figure it out by the simple method already given.

The Shutter The ordinary lens cap will answer, but a studio shutter with bulb is much better, as by its use the eyes can always be upon the subject. The shutter, if possible, should be secured behind the lens in the camera.

The Camera A view-camera is usually too light for the weight of a portrait lens; besides, there are a number of movements about such a camera which, for our present purpose, are not needed and are in the way. A portrait camera will probably be too expensive and also too unwieldy for amateur use. As the best expedient a simple box is advised. A suitable size to make your box is so that it will just receive a 5 x 7 plate-holder. The ground-glass should be, of course, so framed as to correspond to the plate-holder. Grooves should be made at the back of the box so as to receive either holder or focusing-screen, and so placed that when the lens is racked out to its limit it will be in the focus of an object somewhat less than six feet distant. The lens will then be able to be racked in sufficiently to focus on a standing figure. If the lens has no rack and pinion, then, in order to focus, it will be necessary to make a double box, the one sliding in the other. A convenient support for the camera will be an ordinary tripod. If the box is made of hard wood, a small hole can be made in the bottom into which the tripod screw can be screwed. If not, then a hardwood block can be secured to the bottom, in which the hole for the tripod screw can be made.

Reflectors In portraiture, a reflector usually consists of a frame of wood or iron, upon which is stretched some white fabric. One can be improvised by simply holding up a sheet, or placing it upon a piece of furniture. When called into use, the object of a reflector is to make a secondary light, so as to illuminate the

shadows caused by the primary light. Often it is not necessary, but, again, often it is important.

We are sometimes told that reflectors make harsh lights. In this there is a half truth, and only a half. Broadly speaking, all light that we can use is reflected light. Were there no reflections, with the sun even overhead, there would be utter darkness, except upon the face of the sun. To show when a reflector gives harsh light, make this experiment: Have a friend step out into the sunshine with one side of his face directly to the sun. Now hold a small hand-mirror as close as may be to the dark side of his face, but so that the sun is reflected upon a portion of the dark side. Upon comparison you will find that this reflection is much more harsh and glaring than is the direct light of the sun itself on the other side of his face. The lesson is, near reflectors give harsh lights, while distant ones give soft lights. Therefore, if in using a small reflector we have to place it so close that it gives a harsh light, we must use a larger one further off so as to get a soft light. A reflector is often very helpful if we know how to use it properly.

Screens Two kinds of screens are used in photographic portraiture, transmitting and opaque. The transmitting screen diminishes the light by causing it to sift through it, while the opaque screen diminishes it by cutting off a certain amount of the illumination, allowing the remainder to enter around it. Conditions arise in which both kinds of screens come into proper use. Screens may be so made as to answer equally as well for reflectors. They may readily

be constructed as follows: Procure two pine rods about one inch square and six feet long. Using either a stout wire or a thin strip of straight-grained wood, make two circles about three feet in diameter, and secure one of these to each of the rods so that the handles will be three feet long, the other three feet of the rods being lashed to the circles. Cover both circles with some thin cotton fabric, well stretched. Procure from some tailor a small quantity of the black paper which he uses for the making of his patterns, and, by applying paste to it, cover one of the circles. You will then have a transmitting screen, and an opaque one, either of which may be used as a reflector as well. The convenience of these come in in this way: While holding the bulb in one hand for making the exposure, you can with the other hand hold the screen or reflector so as to properly light the face. Being light in weight and flat in form, they may be easily placed behind some piece of furniture when not in use. However, these are not absolutely necessary — they are merely conveniences. With the help of an assistant and things to be found about every house, you may without much trouble improvise both the necessary screens and reflectors for special needs.

Backgrounds Commercial backgrounds are bulky, and consequently troublesome to move about and take care of. The best solution of the matter for the amateur is to make a rough but light frame about seven feet high and about four feet wide. It should be properly braced at the corners and provided with projections at the base so as to stand alone. This will

stand the weather and may be kept in any convenient place outdoors. For use it can be placed where wanted, and covered with any suitable stuff, hung from the top. The flaps or curtains should be at least two in number, not only by their double thickness to prevent the light from the back in striking through, but, being of different shades, different effects may be had. One can be white and the other a gray or brown color. A suitable material is a light-weight duck. Both may be mounted on a single roller, so that they may be easily rolled up and placed in some out-of-the-way place in the house. Frequently in making bust portraits, backgrounds may be dispensed with. If we place the subject ten or twelve feet from a wall or bank of verdure, the nearness of the subject to the lens, the focal length of the lens advised and its large aperture, will so throw the wall or verdure out of focus that the effect will be a really good background. Care must be had, however, that the wall or verdure is not lighted by the sun, as in that case the portrait will appear to be sunk back into it; for it is always the effect of bright lighting to make objects appear to advance, and of dull lighting to make them recede.

The Pose In making portraits any attempt at striking and theatrical attitudes is in bad taste. Also the attitude should not be careless or indolent. There is a certain conventionalism and dignity in a portrait, and these should constitute the spirit of the pose. While the expression of the features should be pleasant, it should only be so in a quiet dignity. Broad

smiles, as a rule, should not be attempted in a regular portrait. Among the charming things of this world, there is probably nothing so beautiful as a fair face brightened by a smile, but in their nature smiles are evanescent, and to perpetuate them in standard portraiture seems hardly proper. However, as in the domain of taste there are said to be no absolute rules, let us admit that if a bright smile on the face of beauty is "caught in the act," the effect is quite pleasing, whether it is serious portraiture or not.

Exposures Outdoor exposures may reasonably be made the basis of a systematic investigation, but exposures in home portraiture are quite another story. The only advice that can well be given the novice is to study the lights on the face and the other conditions, and then make the exposure to the best of his judgment. Let him go now and develop the plate, and he will see whatever mistake he has made. In a frequent repeating of this, he will in time acquire a kind of instinct which no bald rules can teach him. However, as a beginning, in a room by an ordinary window with stop $f/5$, let him try three seconds. Under a porch with stop $f/7$, let him try one second, and outdoors with stop $f/7$, let him try $\frac{1}{4}$ of a second. Of course, fast plates should be used.

Development The best advice here is to stick to uniform conditions and mixtures, in order to secure uniform results. We would advise pyro, but cannot dogmatize here. All the developing agents are good, if we learn how to handle them. Whatever developer you

use, always employ it fresh, in order that you can reasonably count upon uniform results. A soft, rather weak developer is best for portraiture, say something less than two grains of pyro to the ounce of solution. For the amateur, factor-development is usually best, but by experiment he should find his own factor for his conditions. In warm weather and using tap-water, a near uniformity in temperature may be had by using one half from the tap and the other half of ice-water. When well-water is used, always take it fresh from the well. In winter it is best to resort to the thermometer. In making up a developer, the sulphite and carbonate should be proportioned in accordance with the directions of the plates used.

Intensification and Reduction Rather than attempt to doctor negatives, it is almost always better to repeat the exposures; but as this is often impossible, or at least inconvenient, we can sometimes get very fair results by the usual processes of reduction or intensification.

Retouching Often the chief difference between the untouched portraits of the best amateurs and those of the professional lies in the retouching; and, speaking in a whisper, generally those of the amateurs are the better likenesses, and sometimes the most artistic. But the professional is to be defended here: Such is the inordinate vanity of average persons that they demand of the professional, not a faithful likeness, but a pretty picture. If they have rough skins, new and smooth ones must be given them. If wrinkles exist, they must be carefully smoothed away. If their noses are a little crooked, they must be

straightened; and if their mouths are a little wide, the corners must be neatly rounded off.

Now what is the professional to do? He is following photography as a commercial pursuit. It is his means of livelihood. If he did not do as the people wanted, he would have to abandon his business, or rather his business would abandon him. Now, not being embarrassed by the commercial view-point, the purpose of this writing is to teach just views in our subject. Let us then fairly estimate the legitimate uses of retouching.

We have had occasion to remark,
**Color-blind
Plates** in the preceding pages, that both the lens and the chemical inertia of the plate combine to accentuate the natural irregularities of the face. We have now to add, that the ordinary plate is color-blind in a large degree to the red and yellow tints. As a result of all of this, in an untouched negative we not only have the wrinkles magnified, but we have the red and yellowish pimples and blotches much darkened. Even so color-blind is the plate that the bright bloom on the cheek of beauty is degraded to a leaden hue in the print!

Now surely, if we have no right to make people prettier than they are, we have no right to make them uglier. The legitimate use of the retouching pencil, then, is to correct the inherent falsities and deficiencies of the lens and the plate. Therefore it should be sparingly and skilfully used.

Printing If you think that you have done enough when you have produced the negative, you can profitably turn over the printing and mounting to the professional pho-

tographer. All things considered, he will do it for you at less cost than you will do it yourself. If, however, you wish to do this work too, you had probably best take up and master the platino-type process. The gaslight papers are interesting, but they do not always satisfy. For an easy and quick method, the new Matt Self-Toning paper of the Aristo Company will give good results.

Plates It is assumed in this treatise that ordinary fast plates will be used.

Orthochromatic plates are good in theory, and more or less so in practice when the corresponding color-screen is used; but the great increase of exposure necessitated by these screens tends to furnish greater troubles than they cure. Of course, this is only meant to apply in portraiture.

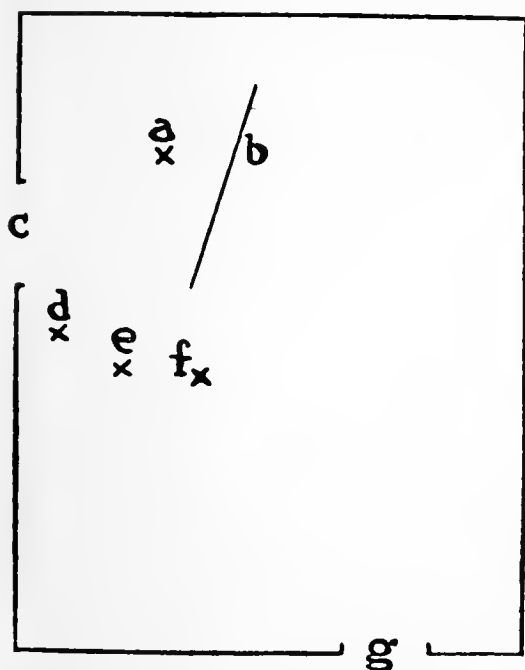
The foregoing brief outline, with all its deficiencies, seems to be as explicit as the space will permit. Let us now take up the consideration of taking portraits by a window in an ordinary room, upon a porch, and by the side of a house.

By a Room Window In an ordinary room with a good-sized window, well lighted by the sky—preferably northern—we place the subject about five or six feet from the window, and some two or three feet to the side. Let him sit with his face parallel with the window. If all the other openings have been closed, and if the window has been blocked off with some opaque fabric to a distance of about four feet from the floor, and we then look at the subject, we will find the light from the window streaming in obliquely upon one side of his face. Now have him turn his face slightly toward the window,

so as just to faintly light the upper cheek-bone. If we should make the exposure now, the dark side of his face would appear in the photograph as quite black. Consequently, we must proceed to lighten it with a secondary light. We may do this by placing a reflector so as to reflect the light from the window to the dark side of his face, and thus blend the heavy shadows into soft

shades.

To make all this plain, we will illustrate it by the accompanying sketch: (Fig. 1). Let *a* represent the person or subject; *b* the reflector; *c* the window; *d*, *e* and *f*, positions of the camera; *g* another



window. As specified above, the window, *g*, is closed. With the subject's face turned as above, if the camera be placed at *d* we shall have a broad lighting; placed at *e* a front view, and at *f* a Rembrandt. We may take our choice; for if the primary and secondary lights have been well balanced, either position of the camera will be good. We are always directed to have all windows

closed but the one, and yet this is not at all times the best advice. If the window, *g*, is opened, the reflector, *b*, being removed, and if the light from this window will soften the shadows on the face as well as will the reflector,—then, by reason of the increased light in the room, the result will be better than the former, provided the light from this second window does not give cross shadows, and secondary catch-lights to the eyes. If it does, possibly you can remedy it by placing the reflector as a screen midway between the subject and the window, *g*. The problem is to get all the light into the room you can, while maintaining the proper lighting or harmonious blending of light and shade on the face.

On the Porch The sun being at the back of the porch, if you learn how, you can produce as good lighting on the porch as can be gotten under the skylight of a studio. Sometimes you can get it, without screen or reflector, by simply having the subject to try different positions. At other times you will need to use the transmitting or the opaque screen. Still again, you may require only a reflector, or you may need both a screen and a reflector. First learn what good lighting is when you see it, and then work with your implements until you get it. More than this books cannot well teach you. You must learn and work the matter out for yourself in practice. If the porch has a wall of the house at one end, you can probably get along without a background, as explained under that caption. If it is open at both ends, then you will need a background to shut off the back light.

**The Shady
Side of a
House**

By hunting out a suitable place on the lawn, you can probably find conditions suitable for a portrait, but it is useless to do this when you always have the shady side of a house. Here you have nearly the advantages of a porch.

In Conclusion

Whether you select a room, a porch, or the side of the house for making the portrait, the important thing is the lighting of the face; and while at first this will seem difficult, yet if persisted in it will open up to you and its developments will become a very pleasing study. After you have well acquainted yourself with the usual and standard method of having the primary lighting on one side of the face and the shadings chiefly on the other, you can then take up other methods. But do not attempt peculiar and unique lightings at first. It is wiser to confine yourself to what you more commonly see on the faces of your friends. A study of the reproductions (now easily had) of the master painters will aid you, although for obvious reasons it will not be practicable to get all of such lightings with the camera. Observe carefully the portrait photographs of others which are said to have excellent lighting, and try to find out in what particulars their excellence lies. Finally, let it be reiterated, that the subject of lighting the human face is of so subtle a nature that it cannot be satisfactorily specified in words and rules. It must find its real development in individual practice, and no one who will bring to the subject a genuine interest need despair of success.

GASTON M. ALVES

Notes and Comment

Cash prizes for photographs. The publishers of THE PHOTO-MINIATURE want the readers of the magazine to get profit, as well as pleasure, from their reading of the little books in this series. To this end they offer cash prizes for photographs made along lines suggested by the subjects dealt with in these pages month by month. Particulars of these competitions are given among the advertising announcements in this issue. The conditions of competition are few and simple; the time allowed is ample for readers abroad as well as at home. The awards will be made by the editor and announced in the first issue of the magazine published after each competition closes.

The first competition offers ten dollars and five dollars respectively for the first and second best photographs of a typical vacation scene or incident. Ten yearly subscriptions to THE PHOTO-MINIATURE will also be awarded to competitors whose prints receive honorable mention. This competition closes October 31. We shall be glad if all our readers will participate in these competitions.



THE "NEW" STEADMAN SYSTEM OF EXPOSURE AND PLATE SPEED MARKINGS.—Mr. Alfred Watkins, whose investigations in exposure and development are well known, asks us to republish the following letter from the *British Journal of Photography*, as of interest to those who read Mr. F. M. Steadman's communication on pages 178-185 of our issue for June.

Gentlemen:—The interesting point about Mr. Steadman's communication in the *British Journal of Photography* of August 5 is the way in which the methods invented and published by other investigators (and largely used by the public) are paraded by Mr. Steadman as "my system of exposure." Where is one original point in the plan he expounds?

Is it the plan of taking a "numerical statement of the light's intensity" by measuring with actinometer the light

actually falling on the subject? I was the one who introduced this as an essential part of a definite exposure system.

Is it the plan of using a diaphragm of such size for a certain plate speed that the actinometer and exposure time shall be the same? I was the first to invent this method, and it is largely used.

Is it the plan of taking the first darkening of the sensitive paper as a guide instead of darkening to a stated tint? I was the first to invent this method, and it is largely used.

Is it the plan of combining the above three methods and publishing a table of diaphragm values to use with different speeds of plates so as to make the exposure the same as the "first darkening" actinometer test? I was the first to give such a table, which is to be found in the instructions of all my meters, in the *Watkins Manual* and in *Exposure Notes*.

Is it the plan of giving on a box of plates as their speed that size 6 [? Ed. P-M.] of diaphragm which makes exposure and actinometer time-equal? Mr. Wynne has adopted this for a long time.

Is it the plan of using an ordinary printing-out chloride of silver paper for the actinometer? The first devisers of actinometers always adopted this, until Sir William Abney pointed out in a *British Journal Almanac* about 1886 that a *sine qua non* in an actinometer is to use the same haloid of silver for testing the light as is used in the sensitive plate. Is it the plan of selecting some particular brand of paper, and therefore getting a new standard for the time of first darkening? Then we shall have a plentiful crop of Luna and Stella and Velox and Mariona plans, paraded (not by the makers of these excellent papers) as "my system of exposure." The table of subject values given by Mr. Steadman is in my experience far too complex. I commenced fourteen years ago by giving a much shorter table of subject variations for use with an actinometer plan. But I have found even this unnecessary for the average worker, and it is most convenient to give one standard subject value only, which applies in nine cases out of ten, whether for outdoor, indoor or portrait. For the tenth exceptional case of sea view, glacier or all-white subject, the necessary variation from the standard can easily be remembered by the photographer.

I am not writing to criticize details of Mr. Steadman's plans. But I should point out that the average eye is incapable of timing the darkening of an actinometer (whether "first darkening" or to a tint) under $1\frac{1}{2}$ or 2 seconds. As far as I can judge by a rough trial, P. O. P. or Solio shows "first darkening" in brilliant summer sunshine in one-third of a second, which is a time quite impracticable for obser-

vation. If a paper slow enough for its "first darkening" to be used as an outdoor test is used as an actinometer, then it will be quite useless for indoor work, as it will take far too long to show any light effect. To use the same paper for indoor and outdoor work, the first darkening plan must be used in the former case and a much darker tint or painted standard out of doors. Yours truly,

Hereford, August 11.

ALFRED WATKINS.



By a fortunate chance the scribe has recently been able to give a little time to making prints from his summer negatives. In this good work the practical advantage of a few commercial specialities has been very plainly demonstrated, and it may help the reader to be reminded of the existence of these little helps in printing. First and foremost come the Ammonium Persulphate Reducer tubes sent out by E. W. Newcomb, Stamford, Conn. For the reduction of negatives which are just a little too dense in the high lights, this reducer is invaluable. The particular advantage of Mr. Newcomb's preparation lies in his method of packing. The salt is one which quickly spoils when exposed to the air, hence Mr. Newcomb puts his reducer up in single-dose tubes. Those who have snap-shot negatives in which the lights are a little too dense, or the gradation somewhat harsh, will find just the thing they want in this reducer. Another specialty introduced by Mr. Newcomb is his package of Retarding Sheets. These are nothing more than 8 x 10 pieces of tissue paper of fine quality, each package containing several different colors. By applying these to the back of refractory negatives, or pasting over a glass form to be put in front of the negative during printing, or for otherwise controlling the speed of printing by pasting the sheets over the front of the printing frame, these retarding sheets materially improve the quality of one's prints. By their use it is a comparatively easy matter to subdue or emphasize any portion of a negative in making the print, and also, what is at times very important, to control the printing speed of negatives of different density, so that they will all come to the requisite depth of printing at one time.



We are particularly desirous of obtaining a few copies of THE PHOTO-MINIATURE No. 11. Readers who have copies of this number and care to dispose of them may send them to us carefully packed by mail, and receive in return their

cash value, 25 cents per copy, or any recent number of of THE PHOTO-MINIATURE series, as they may express their choice.



Mr. Simeon Trenner, of Philadelphia, asks us to advise our readers that although he is the sole American agent for Ross lenses, yet these lenses can be obtained through all recognized dealers in photographic supplies, or from the Rochester Optical Company, Rochester, N. Y.



Mr. W. I. Scandlin, 414 Third street, Brooklyn, N. Y., announces three popular lectures for the forthcoming season which are well worthy the attention of camera clubs and photographic societies. The three lectures are entitled: I. "Heroes of the Sea; the United States Life Saving Service; a Camera Story of its Routine Work." II. "Photography: Its Importance in the History, Science and Economies of the World," and III. "New York through the Camera Fifty Years Ago." Mr. Scandlin has given a good deal of special study to these subjects, and his experience as a lecturer in the New York Educational Lecture Course has given him just that fund of anecdote and good humor which is so essential to the making of an interesting lantern lecture. We cordially commend him to those seeking a pleasant evening entertainment.



A practical and convenient device for framing or matting film negatives is provided by Burke & James, Chicago and New York, in their Ten-In-One Mat. The handling of thin cut films is not the easiest thing in the world, as many amateurs have found out, and it is equally difficult to get the subject always centered for printing. The whole problem is very effectually solved by the Ten-In-One Mat, a sample of which Burke & James will be glad to send to any of our readers who will write for it, mentioning this note. The mat must be seen to be appreciated.



A thoroughly practical exposure meter of convenient size is the Whitney Exposure Meter, recently introduced by R. W. Whitney, 236 Superior street, Cleveland, Ohio. The Whitney Meter consists of an aluminum slide device, measuring four inches by three-fourths of an inch wide,

carrying a standard tint and a piece of sensitive paper by which the actinic value of the light may be ascertained under almost any condition, indoors or out. The front slide of the meter is engraved with columns of figures giving the exposure time in fractions of a second with any lens and diaphragm, when once the actinic value of the light is known. We have tried this little meter under varying conditions and found its use altogether satisfactory. Mr. Whitney tells us that he has compared it with the tables published in THE PHOTO-MINIATURE No. 54 for outdoor work, and finds that it closely agrees with the exposures therein given. The price of the meter is \$1.



Mr. J. Ronald Taylor, the American agent for Taylor, Taylor & Hobson, Ltd., of Leicester, England, returned a few days ago from a European trip. He tells us that the remarkable success of the Cooke lens during their very short experience in America has prompted Messrs. Taylor, Taylor & Hobson to introduce two new series of these famous anastigmats. The new series will work at apertures of $f/4.5$ and $f/5.6$, and are designed more particularly for high-speed photography, for portraiture and for general photographic work on dull days or under poor light conditions. The special circular just about to be issued gives full particulars of these new series, and is illustrated with examples of work done with the Cooke anastigmat. For copies of this circular, address Messrs. Taylor, Taylor & Hobson, Ltd., St. James Building, New York.



Velvet Velox is the latest arrival in the famous Velox family. It is obtainable in three grades,—single-weight, double-weight, and in the form of post-cards. In character and surface finish the new paper stands between the glossy and matt varieties, the surface finish being semi-gloss. The emulsion is such that Velvet Velox is peculiarly adapted to give good prints from the average negative, such as film negatives developed by machine or factorial method. In manipulation it requires the same exposure and development as the special Velox papers. A recent trial of the new product, when we used a gross $3\frac{1}{4} \times 4\frac{1}{4}$ with some sixty film negatives exposed and developed in England, clearly demonstrated that Velvet Velox fulfils all the claims made for it on the score of its adaptability to negatives of varying density and quality.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

SEPTEMBER, 1904

Number 66

Practical Methods of Development

The processes of photography are so curiously interrelated that it is practically impossible to master any one without knowing something of many others. Thus, the development of a negative is, in itself, a comparatively simple matter; but an intelligent explanation of the process, so that the beginner in photography can follow it with success, involves one in not a few difficulties. The wise old man from whom I got my first knowledge of photography understood this, and seldom attempted any formal explanation of its mysteries. But I saw the work done, and the questions were always answered—if one did not ask too frequently. So, in dark-room work, gradually I learned that one big bottle held “the pyro” or developing agent proper; another, “the ammonia” or accelerator, and a third, smaller bottle, was “the bromide” or restrainer for use in cases of over-exposure. Watching these compounded and used day by day, I suppose some sense of their significance and right

use came by seeing. By and by a day came when the formula was given me, and I had to do it all myself. Behold! there were no difficulties. My negatives "came up" in orthodox fashion and, after the usual fixing and washing, in no wise differed from the regular output. I had learned how to develop as the majority of professionals learn, parrotlike, getting the practice without the theory. Thereafter followed much reading, and with it bewilderment and confusion. Photographic literature twenty years ago was rare and dry, as witness the *British Journal* and *Photographic News* of the early eighties.

**The Fallacy
of Formulæ** When the kodak brought the modern amateur into photography with his eternal how? and why? things had to change. The professional knew how to do things but could not teach, and had his prejudices against the amateur. So photographic books and journals multiplied. On the surface there seemed to be more theory than practice, but underneath the amateur spent more time over plates and films than over books. And, as he learned things, he rose to explain. At first success was said to depend on special formulæ. The question of prime interest everywhere was: What developer do you use? And many a proud exhibitor of those days thought he fully justified his medaled work with some such magic phrase as: Beach's Developer. No one-night corn cure ever achieved such world-wide fame as did this formula. Then the astute German, bent on the expansion of his foreign trade, grasped the situation, and across the seas came patent developers by the score,

always with formulæ to which great names were attached as bait for the unlearned. But, what's in a name? applies to development formulæ as to other things mundane, and, after all, the great man's formula did not tell one how to develop *so as to get a good negative every time*. That was the real problem which troubled the amateur. *That is still the problem!*

A Word to the Wise The man who sets out to get a good negative every time will find that he has much to learn about development, and perhaps quite as much to unlearn. It has always been regarded as the critical stage in the making of the negative, an intermediate state wherein wonderful things could be done by those who knew how—"an art," as Bothamley said, "not reducible to a matter of figures." Hence the usual way of mastering development was to get this or that famous worker's formulæ and method, and on that empirical foundation build one's own methods by experience. But, as Poor Richard told us long ago: Experience keeps a dear school. We are beginning to be wiser. The investigations of Hurter and Driffield plainly show that "the production of the photograph is governed by natural laws, and a definite effect must result from a definite cause. The same cause, under the same conditions, always produces the same effect. Only by clearly grasping and working in harmony with these laws can we really become masters of technical photography." Our first step, then, is to seek that scientific knowledge which is a knowledge of things in their causes: to know, for instance, the law governing light-action.

Reconstruction In this search we find the point of view everywhere changing so radically that, in spite of all that has been written about development, we are simply at the threshold of a true understanding of the problem. For this reason, in the light of our present knowledge, the easiest and most direct way of learning how to develop our negatives is to go back to the beginnings of negative-making, and make sure that we rightly appreciate the part played by development in the making of the photograph—what it can do, and what it cannot do. Undoubtedly for some this going back over old ground will be tedious; but it will prove itself well worth while. We may be compelled to reconstruct our working methods on new principles, and to discard the older, traditional systems, as in part irrational or needlessly complicated and difficult. But in the end we shall find ourselves working under more intelligent conditions, with simplified methods which offer equal chances of success to beginner and expert.

Negative and Print Let us begin. When we make a photograph, our purpose is simple: to secure a record of some object of interest. The print, then, is the real end of all our photography. The negative is chiefly valuable or interesting as a means to the end, an intermediate step toward the print—nothing more. Unless we get in the print a record which truthfully describes the object photographed as the eye saw it, all our negative-making is in vain. The professional photographer understands this full well, because his bread and butter depends on the prints he sends

out to his customers. All the really good photographs we see at our exhibitions, or in the public prints, are made on this sure foundation. But the amateur, loving the work for its own sake, all too often loses sight of the print by reason of his keen interest in the technical processes which result in the negative. There is no room, however, for confusion as to the end for which we work in photography. We must know what to look for and how to get it most simply and most surely.

**Wherein
Photography is
Wonderful** The most wonderful thing in photography is its capacity to truthfully represent natural objects, both as regards delineation and light and shade. In this capacity it is unique among known methods of graphic representation. Upon this distinctive capacity rests all its usefulness as an industry, all its interest for us as a hobby. Not all photographs, however, are truthful in their representation of natural objects. Some photographs, as we know, misrepresent the drawing of the subject; there are distortions of size and proportion, parallel lines are seen to converge, straight lines are curved, and so on. Because our sense of correctness in delineation is fairly cultivated, such untruths in the photograph are quickly recognized and condemned. Similarly, many photographs are untruthful in their rendering of tone, misrepresenting the light and shade of the subject as seen by the eye. The reason why so many of our photographs fail to satisfy is here discovered; they do not give us the natural gradations of light and shade which please or interest us in the subject, and which are essential to the

illusion of life and actuality. But this is a more subtle matter than delineation. Our appreciation of truth in light and shade is less perfectly developed, and we are not so quick to recognize errors of this sort. Nevertheless, the technically good photograph of an object or scene in nature, which gives us the natural variety of light and shade in the subject, is invariably recognized with praise; while the average Salonesque print is regarded as the product of one who, for reasons of his own, prefers to "look aslant upon the face of truth." For correctness of delineation in photography we are dependent on the lens and its right use. For the truthful representation of light and shade, we depend on the sensitive plate and our use of its capacity to record the whole range of tones in the subject from highest light to deepest dark. In this little book we leave delineation and the lens out of the question, being wholly concerned with the other side of the problem: how to secure in the negative a faithful record of the light and shade effects of our subjects.

An Unfamiliar Point of View The consideration of light and shade, as exhibited in the objects we photograph, may seem for the moment to be somewhat remote from the development of the negative. It is certainly the last thing thought of by the average photographer, and, even then, is usually considered as belonging to the pictorial rather than to the technical side of photography. As will be seen, however, it has a vital influence for good or evil in negative-making, and there can be little real success in technique until we grasp its practical importance

and learn, like the professional photographer, to regard our subjects unconsciously as arrangements of light and shade.

To get at the significance of this
Its point of view, let us consider the
Significance light and shade effects of any easily imagined subject simply as so many light-intensities—points reflecting light in varying degree at different parts of the subject, according to its illumination. If we mentally arrange these light-intensities in order according to their relative brightness or visual luminosity, remembering that in all pleasing transitions from light to dark the light decreases in geometric rather than arithmetic progression, we shall get, let us suppose, a scale ranging as follows: 64, 32, 16, 8, 4, 2, 1, which expresses a geometric series. On this imaginary scale the light reflected from the deepest shadow in the subject will be represented as 1, and the highest light in the subject as 64. Obviously, if the photograph is to give us a truthful record of the subject, it must include a range of tones from light to dark in which each tone is truly proportional to the light-intensity (or light reflected by that part of the subject) which it represents. In other words, the truthful representation of the light and shade of the subject demands that the tones or luminosity contrasts in the print shall range from light to dark in geometrical progression,—i. e., as 64, 32, 16, 8, 4, 2, 1.

For example: let us suppose that
An we are photographing three houses
Illustration —a white one, a gray one and a black one,—and that their light-intensity values

(or relative visual luminosities) are, respectively, 5 for the black house, 20 for the gray one, and 80 for the white one. Here the progression of light-intensities is geometric, viz., as 1 : 4 : 16. The truthful representation of tone in such a case demands that the relationship between the three houses in the print shall be proportional to the relative luminosity of the three houses as seen by the eye,—i. e., as 1 : 4 : 16.

This applies in every instance.

**Its Universal
Application**

Whenever we see a photograph wherein the tones are true to nature, we may be sure that this relationship of *proportionality* exists. Contrariwise, when we fail to secure this vital relationship between the light-intensities of the subject and the tones in the print, our photographs are necessarily untruthful in their representation of light and shade. As the gradations of tone in the photograph result from the opacities in the negative, it is plain that a similar proportionality between light-intensities and opacities must pre-exist in the negative. *Here we have the key to the truthful representation of light and shade in photography.* With this in mind we can go a step further.

**Light:
The Wonder-
Worker** When we expose a plate or film in the camera, the light-intensities at all parts of the subject begin at once to work a change in the sensitive film. The amount of work done (or light action) is, of course, determined by the intensity of the light at the same part of the subject. Thus, keeping aside for the moment all thought of the form of the thing photographed, the result of ex-

posure is to impress on the sensitive film a latent range of gradations, distributed throughout the film and forming the latent picture image. On development, this latent range of gradations becomes a visible range of gradations, consisting of metallic-silver deposited in the film by the reducing action of the developer. This is the negative.

The Old Way Here we come to the parting of the ways. According to the old-school theories, success in negative-making depended chiefly on skill in development,—always presupposing an exposure sufficient to give a developable image. The perfect negative was, of course, the result of correct exposure and normal development. But the amount of control possible in development—by choice among developing agents, changes in the constituents of the developer, or modifications in the method of development—was generally supposed to be so large that, within wide limits, accuracy in exposure was a minor factor. Hence the widespread belief that a reasonably good negative could be had even though the exposure was much under or over the time correct for the subject. Hence the popularity of this or that developing agent or formula for which great claims were made as possessing peculiar capacities. The only indispensable condition of success was that *one had to know how* to choose the particular developer, how to work the changes required by variations in exposure, how to adjust, modify or control the rights and wrongs of exposure by skilful “tinkering” in development. Out of this system came all those innumerable formulae which bewilder the readers of photographic literature.

**A Way of
Trial
and Error**

Working along these mistaken lines the individual worker accomplished remarkable results. There can be no hesitation in this admission. The sense of conviction flowing through the published papers of Mr. Bennett and other enthusiasts of this school of "control" is almost irresistible. Knowledge and experience, always potent, are especially powerful factors in technical manipulation. But the beginner has little or no chance under such a system, where success depends wholly on repeated trial and error. Hence the significant legend over the door of the dealer in photographic supplies: "We do developing and printing for amateurs." Some account of a typical old-school method—the tentative method of development—is given by Mr. Gaston M. Alves on later pages. Whatever its virtues and conveniences, and despite its appeal to the vanity of "private judgment," there can be no doubt that it is based on an imperfect understanding of the functions of exposure and development.

**The
New Way**

The fallacies of these earlier systems and their lack of a rational basis is clearly demonstrated by the researches of Messrs. Hurter and Driffeld. These investigations are set forth in *THE PHOTO-MINIATURE* No. 56: *The Hurter and Driffeld System*, and make a story of surpassing interest, which the reader is urged to read and re-read as the most valuable of text-books on systematic photography. The system is not one which can be compressed into an intelligible paragraph, but, inasmuch as it forms the basis of rational method

of development here proposed, I must attempt a summary of the points essential to the purpose of this monograph.

Briefly, then, that portion of the Hurter and Driffield system which concerns us here is their investigation of the law governing the action of light on the sensitive plate, and its bearing on the functions of exposure and development. This investigation was undertaken by Messrs. Hurter and Driffield, as amateurs in photography, to answer the question which lies at the heart of all negative-making: What is the law in obedience to which some photographs are true to nature and others are false? As a result of their researches, extending over years of work, they came to the conclusion that the truthful representation of light and shade in photography demanded a technically perfect negative.

This they define as one in which the opacities of its gradations are proportional to the light reflected by those parts of the subject which they represent. This all-important relationship between the opacities in the negative and the light-intensities in the subject depends upon the existence of a somewhat different (logarithmic) relationship between the light-intensity and the amount of silver deposited in development. The establishment of this relationship is, in turn, dependent on correct exposure. It should be clearly understood, however, that the term "correct exposure," as here used, does not imply that there is necessarily one exposure, and one only, which will give us this

perfect negative. As we shall see later, most of the plates and films used in photography offer considerable latitude in this respect, so that the necessity of accuracy in exposure does not confront us with unsurmountable difficulties.

A Vital Difference It is important to note that, in speaking of the gradations in the negative, Hurter and Driffeld separate the qualities of density and opacity as two distinctly different properties. These are often confused and spoken of as being identical, but this is a mistaken notion. *By the density of the gradations in the negative is meant the relative quantity of silver deposited per unit area in development. By the opacity of the gradations is meant the optical property of the deposit to impede the passage through it of light.* "Transparency" is, of course, the inverse of opacity, and is measured by that fraction of the original light which the deposit transmits. These qualities belonging to the gradations of the negative, as we have read, have relationship with each other and to the light-intensities which produce them.

At first sight all this may seem horribly technical and perplexing, but let us see how the system was worked out and many things will be made plain as we go along.

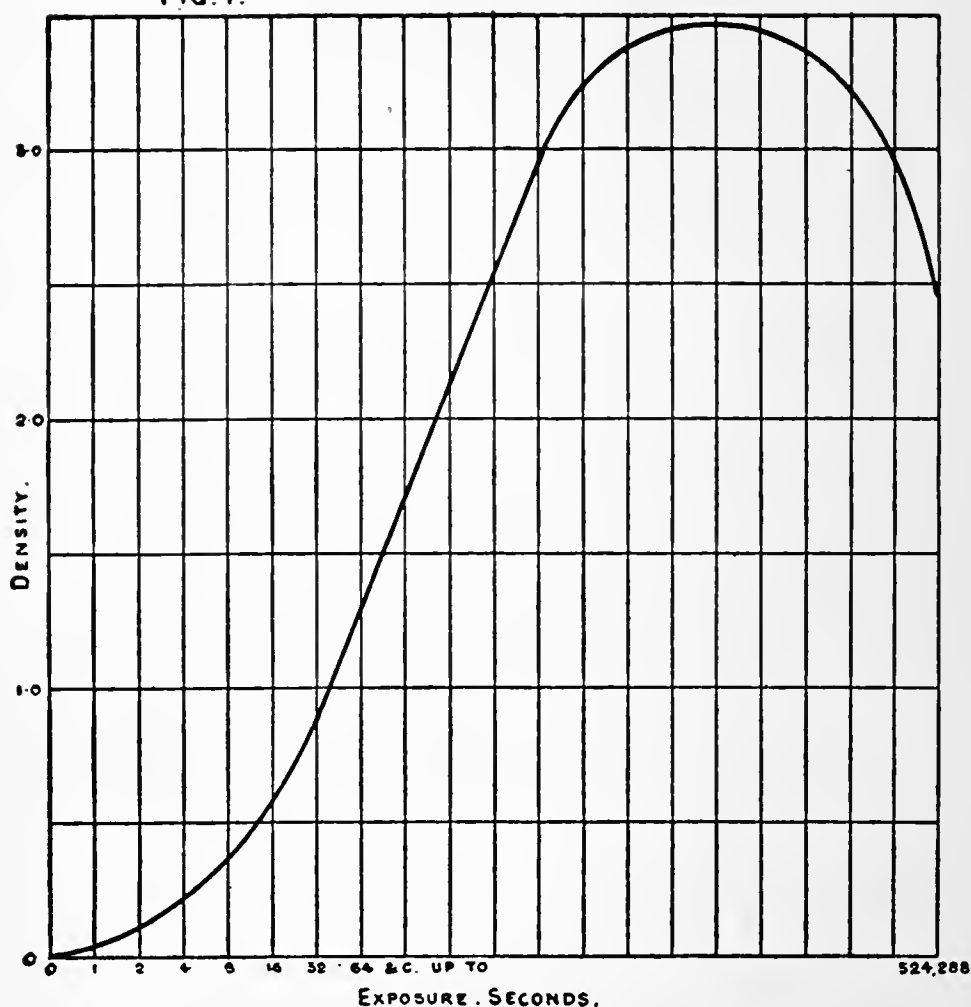
Tracing Light Action In beginning their investigations, Messrs. Hurter and Driffeld took a thickly coated, slow plate and, using a constant source of light, made a series of exposures in geometrical progression,—i. e., 1, 2, 4, 8, 16, 32, 64 and so on, doubling each exposure as they proceeded. This course enabled them to

trace very rapidly the action of light through a large range of exposures on a single plate. On development, this gave a negative in which the successive exposures were represented by a series of gradations. They then measured the densities of the gradations in their test negative, by means of a specially devised photometer. In this way they ascertained the actual weight of silver deposited corresponding to each successive exposure.

The density values thus obtained were plotted by points on a chart represented in Fig. 1. These points were then joined and resulted in a peculiar curve which they styled the "Characteristic Curve" of the plate, because it differs with each different brand of plates tested and also affords much information concerning the speed, capacity as regards the range of gradation, and the general character of the plate. It will be noted that the vertical scale in Fig. 1 indicates density or amount of silver deposited; while the horizontal scale indicates exposure or light-intensity. It will further be noted that the horizontal scale progresses in geometric series, each successive exposure (equi-distant on the scale) being double the preceding exposure; and the vertical scale progresses arithmetically,—i. e., as 1, 2, 3.

An examination of the characteristic curve shows that it consists of four distinct branches, gradually merging from one into the other. It commences with a strongly bent portion which then merges into a straight line; this gradually assumes a curvature in the opposite direction, until it reaches a maximum density, when the

FIG. 1.



curve takes a downward course. The four distinct branches of this curve correspond with the phenomena of under-, correct and over-exposure, and of reversal, with which the practical photographer is familiar in his everyday work.

Nota bene!

These distinctive periods in the action of the light upon the sensitive plate are due to the fact that the work done by the light, at any moment of the exposure, is proportional to the amount of energy received at that moment by the *unaltered* silver bromide; and as the silver bromide is gradually altered, the amount of unaltered silver bromide grows gradually less and less. But for this fact, the *density* of the gradations in the negative would be, throughout the entire range of exposures, proportional to the light-intensities, and truth in photography would be an impossibility. What we require is proportionality between the *opacities* and the light-intensities, and this exists only when the relationship between the densities and the light-intensities is logarithmic. As we shall see, this relationship results from a correct exposure.

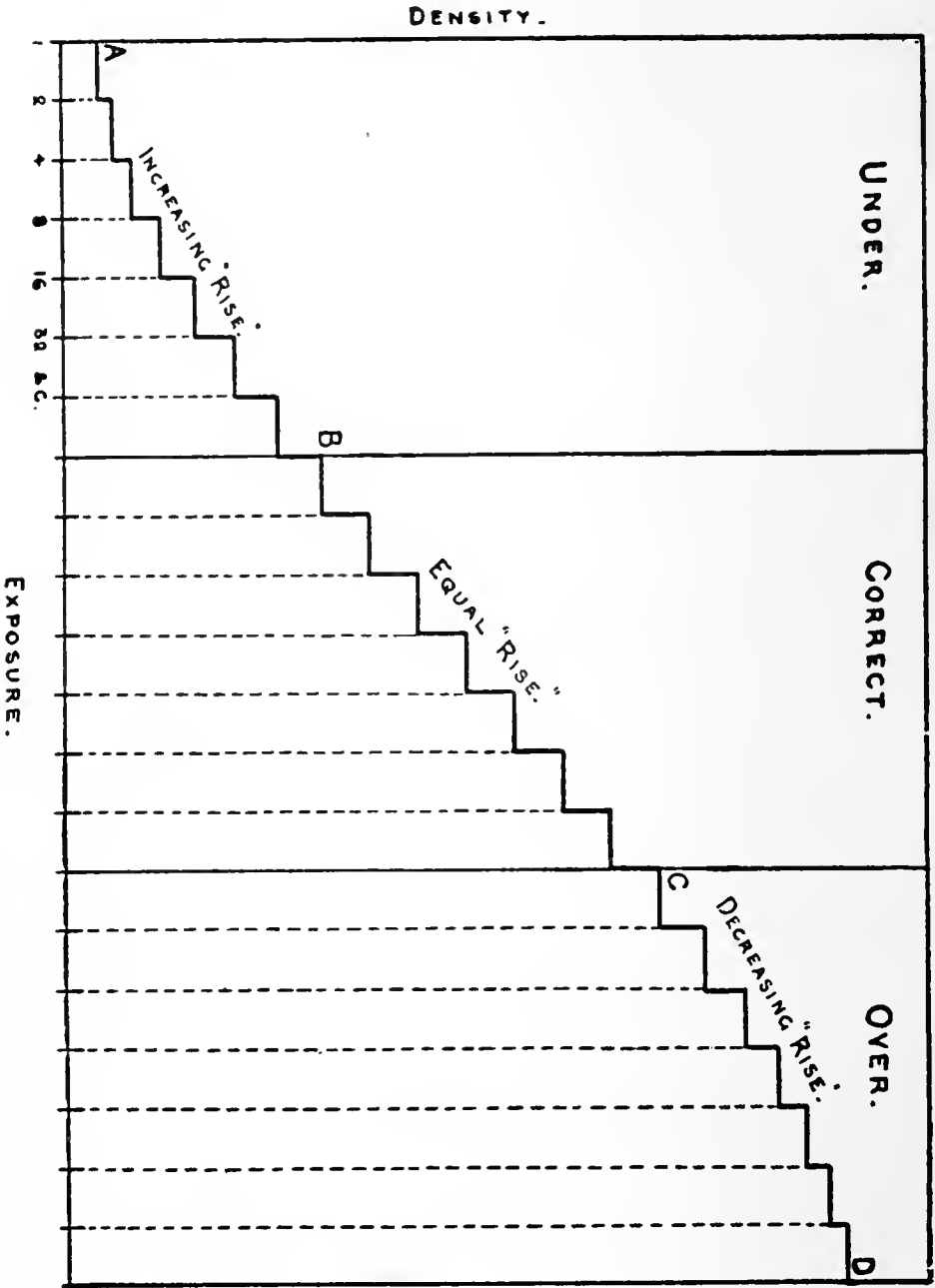
**An
Illustration**

The significance of this growth of density in development and the relationship between density and light-intensity or exposure will perhaps be plainer if we represent it by a series of steps forming a peculiarly constructed staircase, as in Fig. 2, instead of the curve seen in Fig. 1. In this staircase we observe that three distinctly different conditions exist which represent the three periods of under-, correct and over-exposure respectively. The period of reversal may be neglected as of little interest in every-day photography.

**The Period of
Under-exposure**

Having regard to the "rise" of the individual steps in this staircase as indicating increase in density, we note that, commencing at A and

FIG. 2.



proceeding as far as B, the steps are marked by a gradually *increasing* rise, but that at the very beginning of this period this rise is proportional to the exposure or light-intensity. Keeping in view the definition of a perfect negative as given on an earlier page, it will be seen that we have here a false relationship. Proportionality exists between exposure and density, instead of between exposure and opacity. A negative, the gradations of which fall within this period, will represent the shadows and most of the half-tones of the subject by bare glass; while the high-lights will be marked by relatively extreme density—in other words, the negative will be under-exposed.

Next we note that from the point B, and extending to C, the steps in the staircase are all of equal rise; that is to say, each doubling of the exposure is represented by an equal increment of density in the negative. Thus the density grows arithmetically while the exposure progresses geometrically. As the mathematician calls each term of an arithmetic series the logarithm of the corresponding term of a geometric series, it will be apparent that any exposure which falls within this period gives us that logarithmic relationship between densities and light-intensities which is essential to the truthful representation of light and shade. The following ratios will serve as an example of this relationship.

Light-intensities (exposure)	1 : 4 : 16	(geometric progression).
Silver deposited (density)	0 : 0.6 : 1.2	(arithmetic progression).
Opacity	1 : 4 : 16	(geometric progression).

Thus we see that the photographic plate is capable of giving a range of opacities truly proportional to the light-intensities of our subjects, but only on condition that all its gradations fall within that portion of the staircase (Fig. 2) in which the steps are of equal rise; or, in the case of the "characteristic curve," within that portion represented by a straight line.

The Period of Over-exposure Referring again to the staircase, the period of over-exposure begins at C and continues till the highest step is reached, when the period of reversal sets in. In this period, the growth of density is marked by a gradually *decreasing* rise in the steps, which finally becomes imperceptible. A negative the gradations of which fall within this period would be as false in its representation of light and shade, but in an opposite direction, as if its gradations fell within the period of under-exposure. The characteristic of under-exposure is too great contrast between the tones; in the period of over-exposure the contrasts are too small. The tendency of the gradations in cases of over-exposure is (as we see in the steps) to approach one uniform density; hence the flatness and lack of contrast in over-exposed negatives, in which the high-lights and half-tones are represented by almost similar opacities. Obviously, if the negative is to yield a print true to nature, it must include no steps in the under- and over-exposure portions of the staircase, but its densities must fall within the straight portion of the "characteristic curve." This is secured by a correct exposure.

**What Happens
in Development**

Having by means of a correct exposure established a true relationship between the latent gradations of the negative and the light-intensities, the function of development is to reduce the latent image to metallic silver. The average photographer would describe the process by saying that, as development proceeds, the negative becomes denser. Something more than this is involved, however, as the duration of development materially influences the result.

**"Density
Ratios"
Constant**

By conclusive experiment, Hurter and Driffield have demonstrated that, although the total amount of density increases as development is prolonged, the relationship between the densities, as established by exposure, remains identical and unchanged, whether the development be long or short. In other words, the density ratios are constant and independent of the time occupied by development. Thus, if we give three plates identical (correct) exposures and develop them respectively for two, four and six minutes, the total density throughout the gradations of the three plates will increase correspondingly with the time of development, but the relationship between the densities in each negative will remain unchanged. This led to their recognition of the law of "Constant Density Ratios," which, once grasped, does away with the old-time misconceptions regarding the possibilities of control or modifications in development, either by changes in the developing solution, choice of developing agent or method.

But, though the density ratios are constant, the opacities which appeal to the eye do alter, both in amount and ratio, as the time of development is prolonged. Hence the range of light-intensities transmitted by the correctly exposed negative developed for four minutes will be far greater than the range transmitted by another correctly exposed negative developed for two minutes. The alteration in opacity ratios is not, however, variable or controllable at the will of the photographer, but they alter according to fixed laws; just as, by the same laws, we have seen that the density ratios are invariable.

From this and the preceding pages, the reader will have perceived that density forms the connecting link between exposure and opacity. In order to make the relationship between *density* and *opacity*, and again, between *transparency* and *opacity*, as clear as possible, I insert here a table and three diagrams, prepared by Mr. Julius Martin, to illustrate this triple relationship.

The relation of *density* to *opacity* is numerically shown by the figures in column 2 of the table.

Incidentally, a study of columns 1 and 2 will serve to illustrate the wide variation between density and opacity, and the growth of opacity as compared with the growth of density during development. The general belief that density and opacity are one and the same thing is here seen to be based upon a misconception.

The relation of *transparency* to *opacity* from the corresponding values of *density* and *opacity* in columns 1 and 2 is seen in column 3 of the table.

TABLE

Showing the comparative values of density, opacity, and transparency, according to the Hurter & Driffield System at Speed Determination.

By JULIUS MARTIN

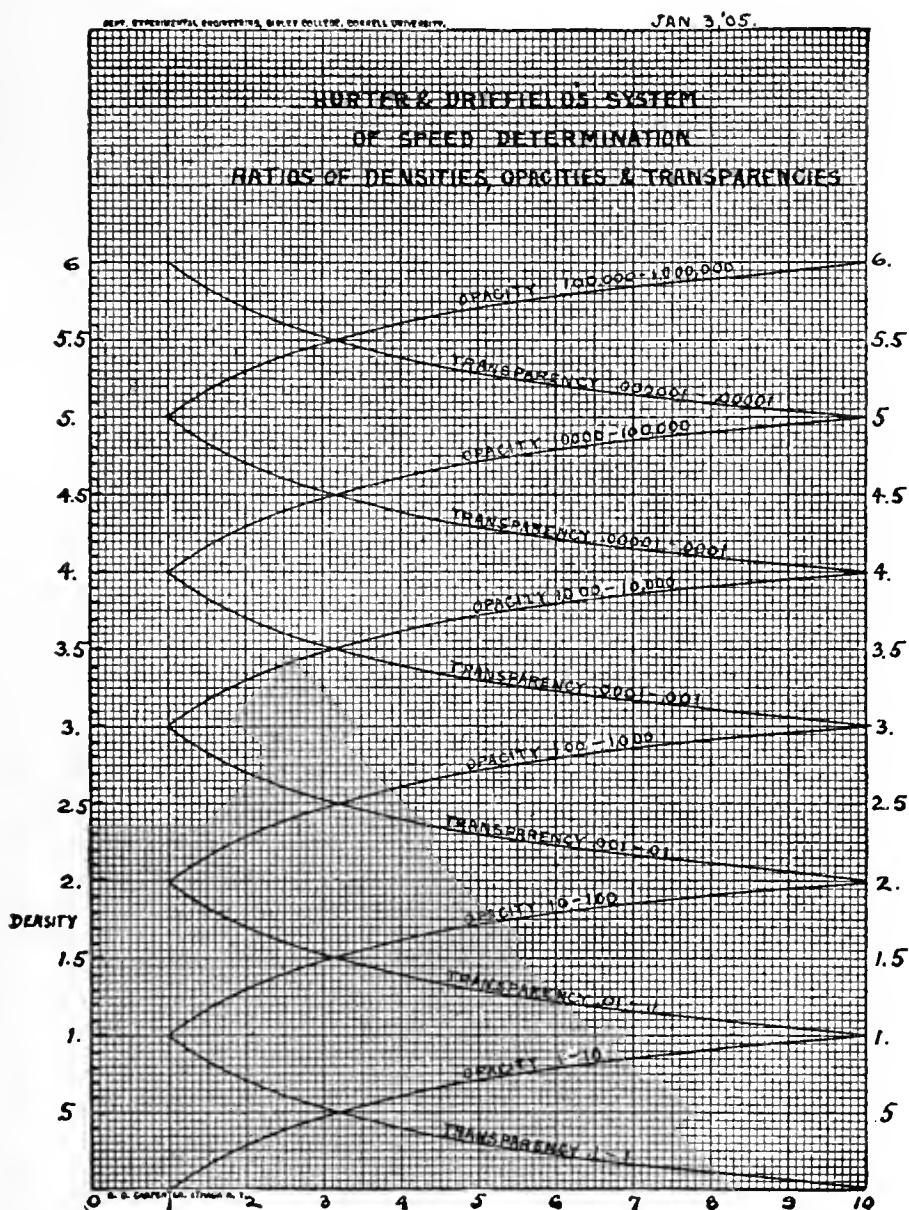
I DENSITY	II OPACITY	III TRANSPARENCY
.0	1.	1.
.1	1.26	.793
.2	1.6	.628
.4	2.5	.397
.6	4.	.251
.8	6.3	.158
1.	10.	.100
1.2	16.	.0628
1.4	25.	.0397
1.6	40.	.0251
1.8	63.	.0158
2.	100.	.0100
2.2	159.	.00628
2.4	252.	.00397
2.5	317.	.00316
2.6	398.	.00251
2.8	631.	.00158
3.	1000.	.001
3.2	1585.	.00063
3.4	2512.	.000398
3.5	3161.	.000316
3.6	3982.	.000251
3.8	6310.	.000158
4.	10000.	.0001
4.2	15850.	.0000628
4.4	25120.	.0000398
4.5	31631.	.0000316
4.6	39820.	.0000251
4.8	63100.	.0000158
5.	100000.	.00001
5.2	158500.	.00000628
5.4	251200.	.00000398
5.5	316310.	.00000316
5.6	398200.	.00000251
5.8	631000.	.00000158
6.	1000000.	.000001

Intermediate Values It will be noticed that the opacity and transparency values corresponding to the densities 0, 1, 2, 3, 4, 5, 6 in the table are expressed in multiples of 1. Advantage has been taken of this to plot the complete range of values in a series of curves (Fig. 3), from which the intermediate values omitted from the table may be obtained when required.

On this chart the density values are given on the horizontal lines crossing from side to side, the corresponding opacity and transparency values being found at the intersection of the density lines with their respective curves, in connection with the figures given at the base of the chart. These latter are relative, the multiple of 1 corresponding to the base figure 1 from which all the curves start, being obtained for each curve from the first of the two figures given just over each respective curve.

Example of Use To find the opacity and transparency values of density 1.5, find this figure at the left-hand side of the chart and trace the line until it intersects the opacity curve 10-100. Connect the intersection of the density line on this curve with the figure at the base and we get the corresponding value in opacity 32. The transparency value is found in a similar way, the point of intersection on the transparency curve .01-.1 being identical in this instance with that for opacity, and reference to the figure at the base of the chart gives us the transparency value as .032. In this way we may compare the values at any desired point.

FIG. 3



More Curves For a graphic comparison of density, opacity and transparency values, the reader is referred to Fig. 4, in which Diagram B shows the curve describing the increase of density; Diagram A gives the curve of opacity showing how this increases enormously as compared with the growth of density; and C shows the transparency curve, this being the inverse of the opacity curve in A.

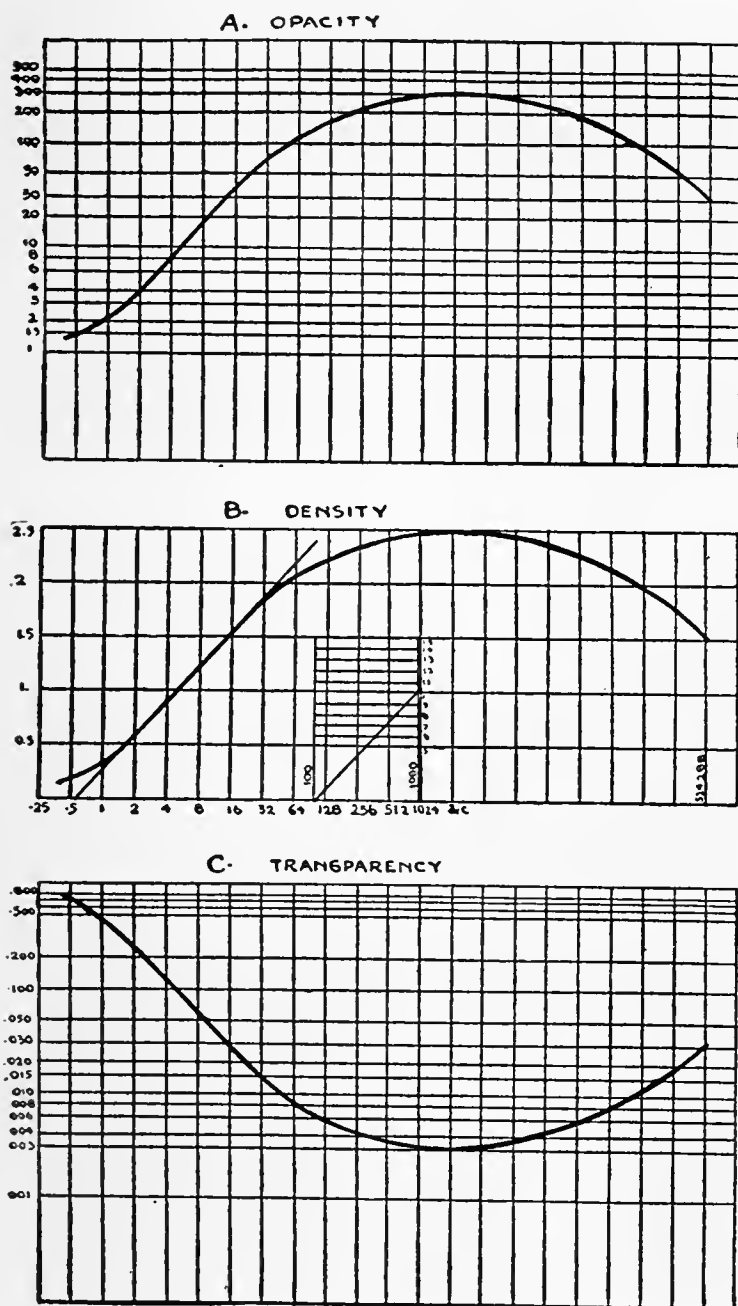
Practical Conclusions The practical conclusions to be drawn from this discussion of the somewhat involved relationships between light-intensities, densities and opacities may be summarized as follows:

1. The truthful representation of light and shade in the photograph demands that the opacities in the negative shall be proportional to the light-intensities in the subject.

2. This truthful relationship between the opacities and the light-intensities depends on the existence of a truthful (logarithmic) relationship between the densities of the negative and the light-intensities, which can be established only by giving the plate a correct exposure.

3. It is the function of exposure to determine the relationship which shall exist between the densities and the light-intensities they represent. As established by exposure, and whether true or false, this relationship is unalterable by any modification in the developer or in development. If the exposure is correct, the densities will bear a truthful (logarithmic) relationship to the light-intensities and the opacities will yield a visible image (the print) true to nature in its gradations.

FIG. 4



If, on the other hand, the exposure is incorrect, the relationship established between densities and light-intensities will be false, and no modifications of the developer or changes in development can give opacities capable of yielding a print true to nature in its gradations. Hence correct exposure is imperative as a fundamental condition for the production of a photograph true to nature.

4. It is the function of development to reduce the latent image (given by exposure) to metallic silver, and to determine, by its duration, the extreme range of opacities which the print will include.

In other words, success in negative-making plainly depends on exposure and not on any special skill in development. It is worth a great deal to know this, and to know further that our belief is based on scientific fact. Obviously, this knowledge immensely simplifies all photography, making plain what we must work for and how to attain our end most simply and most surely.

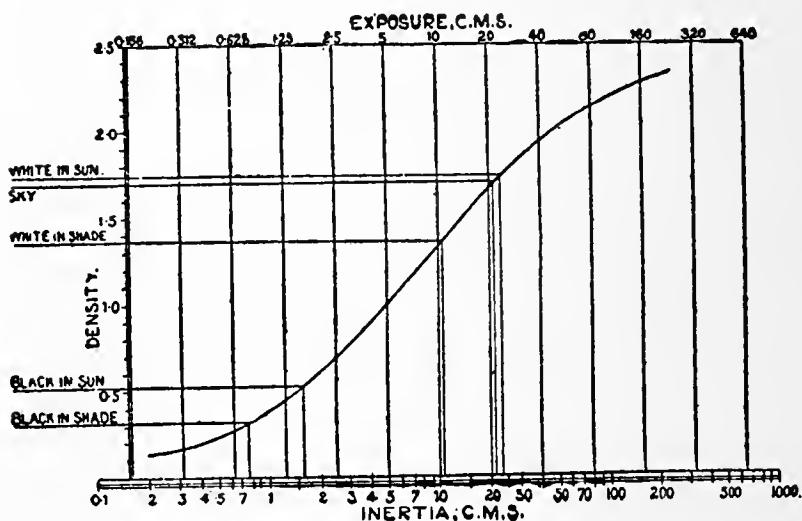
Our first concern, then, must be to learn how to give our plates a correct exposure every time. Having accomplished this, the only difficulty presented in development is to know when to stop, i.e., when the opacities exactly represent the ratio of the light-intensities in the subject. The necessity of a correct exposure, as already hinted at, need not unduly disturb the reader. For every plate or film there is a range of exposures during which the relation between the densities and the light-intensities is so nearly logarithmic that we may neglect the difference between truth and its

approximation. The more richly coated the plate, the wider is this range, and the more extended is the scale of gradations (or light-intensities) which the plate can render truthfully. Thus this range expresses what we call the latitude of the plate as far as exposure is concerned, i. e., the limits of exposure within which the negative will give a truthful record of the light and shade of the subject. This capacity of the plate is obtained from the characteristic curve of the plate, and comprises the straight portion of the curve (see Fig. 1) or the period of correct exposure (see Fig. 2). Its extent varies with different brands of plates; usually it is dependent on the amount of silver haloid in the plate and is greater in slow than in fast plates. Obviously, too, the latitude of exposure, in any plate, is influenced by the range of light-intensities in the subject, and also by the degree of truth with which the contrasts of the subject are to be presented in the print.

An Illustration In Fig. 5 we have the characteristic curve of a plate the range of which may be taken as 1 to 60. Any exposure which will include the range of light-intensities in the subject within these limits will be a correct exposure. As the total density of the negative increases with the exposure, however, the photographer will always aim at an exposure which will cause the gradations of his negative to begin at the lowest portion of the straight line representing the correct period. The best possible negative is, of course, one which combines truthful representation of the subject with minimum density; but, owing to the practical difficulty of attain-

ing absolute accuracy in exposure with widely different conditions, we can well content ourselves if we so manage that we get the gradations of the negative anywhere within the limits of the period of correct representation. This can usually be done with the aid of an exposure meter or reliable set of tables. It should always be remembered, however, that these give the shortest possible ex-

FIG. 5



posures under given conditions, so that exposures slightly in excess of the figures in the tables or indicated by the meter used will be advisable.

The range of light-intensities reflected by different classes of subjects is a matter about which many photographers are poorly informed.

Messrs Hurter and Driffield give the range of a subject including white cardboard in sunlight and black velvet in shade as 1:30. The latitude of the plate shown in Fig. 5 for such a

range would be as 1:3, that is the exposure could vary from 1:3. In interior photography the range will be less, allowing a correspondingly greater latitude in exposure. In portraiture the range of light-intensities is usually very limited, say 1:10, giving a still greater latitude in exposure without loss of truth in representation. Dealing with this Mr. F. Dundas Todd, in the November issue of the *Photo Beacon*, shows a series of practically identical prints from negatives including exposures varying as 1:16. This may be taken as an exceptional instance, a safe range with the average plate being as 1:4 or 1:5.

This must conclude our glance at the Hurter and Driffeld system and its bearing on exposure and development. All mention of their advocacy of a numerical system for the expression of development factors and their method of determining the speed and other qualities of plates must for the present be omitted, to give room for the practical application of the principles herein discussed. The interested reader will doubtless refer to the detailed information in *THE PHOTO-MINIATURE* No. 56 for his further advance along the lines here indicated. Until the amateur or professional learns to test his plates according to the Hurter and Driffeld system, or our manufacturers give us the "characteristic curves" of their plates in every box, our knowledge of their latitude can come only from our experience with this or that plate.

With this knowledge of the
The Wallace Hurter and Driffeld system and its
Method basis, we can now begin to apply
it in practical work. Since exposure is, as we

have shown, the prime factor in negative-making, which determines once and for all its truth or falsity as a record of the subject photographed, it is plain that development is enormously simplified, being in fact merely a process which reduces the latent image to metallic silver, the truth or falsity of the record being determined by the exposure. In the following method of development worked out by Mr. W. H. Wallace and here first published, we have development reduced to its simplest terms. It gives us all that we can obtain by any other method, and at the same time gives us perfect control over the total range of opacities to be included in the negative.

This method is based on the principles of time and temperature development indicated in the Hurter and Driffeld system, and also resembles somewhat the well-known system devised by Mr. Alfred Watkins, the "time of appearance" being omitted from consideration. It gives without unnecessary detail, and in the fewest possible words, a method and formulæ which will enable the tyro as well as the expert worker to get the utmost from his exposures with the least possible trouble or chance of failure.

Pyro It will be seen that the method consists essentially of a formula and tables giving the time and temperature at which this formula will give opacities the values of which are expressed in figures at the head of the table. Pyro is advised as being best adapted for this system, and the formula given will be found to answer all the requirements of widely varying classes of work. Lest the reader should conjure

up the spectre of stained fingers usually considered inevitable with the use of pyro, I would mention that the well-known staining qualities of pyro do not apply in the use of this system, as there is no necessity for putting the fingers into the solution at all, and the color of the negative can be regulated to a nicety by the proportion of sulphite included in the formula. Pyro, has the additional virtue of cheapness, an important point in this method.

It should be noted that as no two brands of emulsion will work at just the same speed with any given developer, even though they come from the same maker, a trial or two may be necessary to get just the right degree of contrast with this or that brand of plates for different subjects. In this it is only necessary to remember that the range of opacities (or contrasts) is determined solely by the duration of development: the higher the factor, the greater the opacity or contrast. Once the correct contrast factor with any given plate for a normal subject has been ascertained, it will not be necessary to change the factor except for some special purpose or for a different class of subject, according to the preference of the individual worker. Obviously changes in temperature, the only condition at all difficult to control in this system, may to a certain extent be compensated for by slight variations in the length of development.

The developer is made as follows.
The Formula *Stock Alkali Solution:* Water, 24 ounces; sodium carbonate (dry), 1 ounce; sodium sulphite (dry), 1 ounce. *Stock*

Pyro Solution: Water, 9 ounces; oxalic acid, 12 grains; pyro, 1 ounce; add water to make the bulk of the pyro solution up to 10 ounces. *To develop, take:* Alkali solution, 6 ounces; pyro, $\frac{1}{2}$ ounce. This makes a strong solution suitable for use with temperatures below 20° Cent. (68° Fahr.). With temperatures above this it works rather too rapidly for convenience and should be diluted with an equal bulk of water. In this event it is necessary to develop not quite as long again for the same contrast.

Its Preparation In making up the formula given, the solutions are best prepared with water which has been heated to boiling point and allowed to cool somewhat before use. This is not necessary when only sufficient solution is made up at one time to last two or three weeks, as the use of boiled water is advised only in order to enhance the keeping qualities of the solutions. As a rule, water that is fit to drink is also suitable for developing purposes. Although the formula specifies dry sodas, the crystal form may be used by making the solutions to hydrometer test. In this use prepare carbonate and sulphite of soda solutions separately to hydrometer test 40° and then mix. In making up the formula by weight, Seeds C. P. sodas or any equally pure brands are advised.

Fresh solution must be used for each plate or batch of plates, if more than one is developed at one time. A good way to determine the minimum quantity of developer required is to place in the tray an equal number of waste plates and measure the quantity of water which is required to

cover them when at rest. A few trials will quickly determine this point.

Importance of Temperature The trays and solutions used for developing should be kept together in the room where the work is to be done, so that they will all be at approximately the same temperature. Naturally, in this system uniformity in results depends largely on this factor of uniform temperature. It is also necessary to observe reasonable accuracy in making up the developing solutions. If the thermometer in the dark-room hangs clear of its support, and there has been no recent severe change, the atmospheric temperature may be relied upon, otherwise the solutions should be tested just before beginning work. Always keep a glass or earthenware vessel filled with water and exposed to the air in the dark-room for the making up of stock solutions. Never take water from the tap for immediate use. Keep the solutions moving gently during development.

How to Use the Method The method of using the tables is as follows: Having prepared the developer and taken care to have the various solutions at approximately the same temperature, the temperature is first noted. Now find this degree of temperature in the first or second column at the left-hand side of the table (accordingly as the Fahrenheit or Centigrade thermometer is used) and at the intersection of the horizontal line with the vertical line leading to the contrast factor desired, will be found in minutes and seconds the length of time to develop at this temperature. To illustrate: Suppose we are using a factor of 6 as giving us the desired

range of contrasts, and that the temperature is 23° Cent. (73° Fahr.). At the intersection of the lines 23 and 6 will be found the figures 2 and 55, indicating the time of development as 2 minutes and 55 seconds. Similarly, if the temperature is 20° Cent. (68° Fahr.) and the factor 5 gives us the required range of contrasts, at the intersection of the two lines 20 and 5 will be found the figures 3 and 10, indicating that the time of development should be 3 minutes and 10 seconds. This is all we need to know. The plate is immersed in the developing solution, covered with a tray, and at the end of the indicated time is taken out of the developer, rinsed under the tap and placed in the fixing solution.

With regard to the choice of the contrast factor among those given at the head of the table, this must be determined by the personal preference of the individual as to the general character of the negative desired. Naturally this preference will be considerably influenced by the amount of contrast in the subject, this depending on the character of the subject and its illumination. In a normal subject such as a sunlit landscape, where the range of contrasts is fairly large, softness will be gained by choosing a low contrast factor, and crispness with a decided relief can be secured by the choice of a somewhat higher factor. In portraiture, where the range of contrasts is often small and softness is generally desirable, a low contrast factor is usually necessary. Contrariwise, in photographs of carvings in bas-relief, where the contrasts in the subject usually require emphasis, a somewhat higher contrast factor should be chosen.

TIME AND TEMPERATURE TABLE FOR USE WITH THE WALLACE
METHOD OF DEVELOPMENT, THE TIME BEING GIVEN IN
MINUTES AND SECONDS.

Tempt. F. C.		CONTRAST FACTORS												
		4	4½	5	5½	6	6½	7	8	9	10	11	12	13
59°	15°	3min 55 sec	4 25	4 55	5 25	5 55	6 25	6 55	7 50	8 50	9 50	10 50	11 50	12 50
60°	16°	3 30	4 00	4 25	4 50	5 20	5 45	6 10	7 05	7 55	8 50	9 45	10 35	11 30
62°	17°	3 15	3 40	4 05	4 30	4 55	5 20	5 45	6 30	7 20	8 10	9 00	9 50	10 40
64°	18°	3 00	3 20	3 45	4 05	4 30	4 50	5 15	6 00	6 45	7 30	8 15	9 00	9 45
66°	19°	2 45	3 05	3 25	3 45	4 05	4 25	4 45	5 30	6 10	6 50	7 30	8 10	8 55
68°	20°	2 30	2 50	3 10	3 30	3 50	4 05	4 25	5 05	5 40	6 20	7 00	7 35	8 15
70°	21°	2 20	2 35	2 55	3 10	3 30	3 45	4 05	4 40	5 15	5 50	6 25	7 00	7 35
72°	22°	2 10	2 25	2 40	2 55	3 10	3 25	3 45	4 15	4 50	5 20	5 50	6 25	6 55
73°	23°	2 00	2 10	2 25	2 40	2 55	3 10	3 25	3 50	4 20	4 50	5 20	5 50	6 15
75°	24°	1 50	2 00	2 15	2 25	2 40	2 55	3 10	3 35	4 05	4 30	4 55	5 25	5 50
77°	25°	1 40	1 50	2 05	2 15	2 30	2 40	2 55	3 20	3 45	4 10	4 35	5 00	5 25
79°	26°	1 30	1 40	1 55	2 05	2 20	2 30	2 40	3 05	3 25	3 50	4 15	4 35	5 00
80°	27°	1 25	1 35	1 45	1 55	2 05	2 15	2 25	2 45	3 05	3 30	3 50	4 10	4 35
82°	28°	1 15	1 25	1 35	1 45	1 55	2 05	2 15	2 30	2 50	3 10	3 30	3 50	4 10
84°	29°	1 10	1 20	1 30	1 35	1 45	1 55	2 05	2 20	2 40	3 00	3 20	3 35	3 55
86°	30°	1 05	1 15	1 25	1 30	1 40	1 50	2 00	2 15	2 35	2 50	3 05	3 25	3 40

Next among modern methods comes the now well-known and widely used Factorial Method devised by Mr. Alfred Watkins. The best recent description of this method is that given in *The Practical Photographer* for June, 1904, from which the following extracts are taken with acknowledgment. The reader should note that from here to the end there is more or less divergence from the findings of Messrs. Hurter and Driffield as given in earlier pages. In other words, the Watkins Method and that following are individual methods and should be independently considered without reference to the work of Hurter and Driffield.

The Watkins Method "In 1893 Mr. Watkins noted the time which elapsed between pouring a developing solution on an exposed plate and the appearance of any sign of development of image, i. e., "time of appearance." He also noted the total time the plate took to acquire a certain degree of contrast ("total time"). He then found that, using the same developing agent (pyro, metol, quinol, etc.), the ratio of the time of appearance to the total time was constant for a fixed degree of contrast range.

"An example will make matters clear in a moment: A plate is exposed for one second on a certain subject and then developed with, let us say, ortol. The image appears in 30 seconds, and the required density contrasts we obtain at the end of ten times 30, or 300 seconds. (Note that the ratio or factor is 10 in the case of ortol.) A companion plate is exposed on the same subject for six seconds. Using the same developing formulæ, let us suppose the image appears in 25

seconds. If, now, we withdraw the plate in ten times 25, or 250 seconds, we shall find these two negatives yield practically identical prints, although the time of printing may—probably will—be slightly different.

“Further, we may modify our developing formula by adding more water, alkali, etc. This may perhaps defer the appearance of the image to, say, 50 or 60 seconds; but if we adhere to the same ratio, multiple or factor, *ten*, and carry on development for 500 or 600 seconds, as the case may be, then the resulting negatives, possibly differing in appearance to the eye, will nevertheless yield the same contrast range in the print.

“If, however, we elect to use some other developer, such as metol or quinol, then, instead of the ortol factor, 10, we must employ a factor of 30 with metol, or 5 with quinol. This being done, the same range of density contrasts will result.

“The following table is a quite possible state of affairs for different exposures on the same subject;

Plate	Exposure	Time of Appearance	Developer and Factor	Total Time
1	3 secs.	12 secs.	Metol . . . 30	360 secs.
2	5 “	45 “	Quinol . . . 5	225 “
3	1 “	25 “	Ortol . . . 10	250 “
4	10 “	10 “	Rodinal . . 40	400 “

when all four negatives would yield the same light and shade contrast in the print.

“To simplify matters, Mr. Watkins designed an ingenious form of clock with a slide calculator attached, which saves the user the trouble of

multiplying the "time of appearance" by the "factor" in order to get the "total time." This form of clock is called an eikronometer. We now can see how this system is known as the time or Factorial Method of development. It is a *timing* system of development based upon the use of *factors* introduced by Mr. Watkins and simplified by means of his *eikronometer*.

Classification of Developers "It is convenient to group developers into (1) those that bring out the lower tones soon after the appearance of the high-lights—for example, metol, rodinol and weak pyro. If the plate is withdrawn at an early stage, the result is a weak and flat negative with detail in the shadows. (2) Those that do not bring out shadow detail, i. e., lower tones, until the lighter tones have attained a moderate density—for example, quinol, edinol and strong pyro. If the plate be withdrawn at an early stage, it presents moderate contrast and little or no detail. Inexperience might hastily conclude that the latter plate was under-exposed and the former over-exposed, while if development had in each case been appropriately prolonged, equally satisfactory negatives would have resulted. (3) There are a considerable number (e.g., ortol and moderate pyro) which are of an intermediate character.

"The detail-holding-back property of bromide is more marked in Class 2 than in Class 1, hence where black and white results are desired one would naturally elect to use a member of Class 2 with ample bromide.

"As regards general efficiency for the same quan-

tity of alkali, metol, ortol and pyro take first rank.

Blending Developers “By mixing two or more developing agents we are able to get a blend which combines or averages their several qualities, hence the popularity of such mixtures as metol and quinol.

Alkali “Varying the alkali alters the speed of working of the solution. Excess of alkali is liable to produce fog.

Water “Diluting the developer is equivalent to reducing the alkali (and bromide) and slowing the action generally. But a dilute developer in a long time will yield the same result as the undiluted form does in a shorter time, e.g., in tank development.

Time “This is the chief means of control of contrast range. By increasing the factor or ratio of “total time” to “time of appearance,” greater contrast is obtained by that developing agent. This must not be confounded by comparing the total time with two different agents, for a low-factor developer with short time of appearance would give a more contrast range in less time than a high-factor agent with long time of appearance, thus :

	Factor	Time of Appearance	Total Time for Equal Contrast
Developer X ..	8	15 seconds 2 minutes
Developer Y ..	12	30 “ 6 “

Limits “There is an obvious limit to the rule that the longer the development the greater the contrast, and this begins as soon as the highest light has attained the greatest density the plate can give. Prolonging develop-

ment beyond this point means that the second, third, etc., next lower densities will tend to become equal to the maximum density possible. From this point contrasts are being obliterated at this end of the density range and contrasts reduced.

Fog “This may set in before the density of the high-lights is attained. If development be carried on after fog sets in, no further gain of contrasts will be obtained; indeed, contrasts are much more likely to be reduced.

Temperature “In general, the warmer the developing solution the more energetic its action. If it is too warm, fog may result; if too cold, action may be impractically slow or cease altogether. The practical range is from 45° F. to 75° F., and either extreme should be avoided.

“The effective speed of the plate is increased by the use of a high temperature. In such cases the gelatine should be first rendered insoluble by means of formalin, chrome alum, etc. The developing solution and dish containing it must be maintained at the desired temperature.

Halation “Long-factor developers and those without bromide bring out halation sooner than short-factor ones, especially if bromide be used with the latter.

Comparing Different Developers “Let an exposed plate be cut in half, and each half be developed by a different developing agent free from bromide or other restrainer; then, if enough time be given to bring out the lowest tones in both cases and the plate be removed when the highest lights have attained

equal density, the gradations of contrast will be the same in the two portions.

Control "Increasing the bromide or decreasing the alkali tends to hold back the lower tones for a time, and so gives a measure of control. But these alterations must be made before the developer is poured on the plate. It is too late to make the alteration when once the image has put in its appearance. The chief value of such control is in cases of over-exposure, which is usually not detected until the image has appeared and the opportunity for control passed.

"Selection of a Developer is largely a matter of fancy. Roughly stated (the influence of bromide excepted), the same final results can be got with any developing agent. The chief thing is to arrange the proportion of water, alkali, etc., so that it does its work in a convenient length of time.

The Subject "By modifying the factor we have a measure of control of density contrasts. Thus the contrast range may at discretion be adapted to the subject. It is obvious that we do not desire the same contrast range in all subjects. Mr. Watkins suggests, in cases where there is no white part or high-light such as sky (architecture, for example), to observe the time of appearance of the highest part of the image and take three-fifths of this as the time for multiplying by the factor; because, had there been a high-light it would probably have appeared in three-fifths of the observed time. In sky and cloud negatives, when a decidedly soft effect is generally wanted, it is suggested that

the factor be reduced to two-thirds normal. Thus if the factor be 15 for ordinary conditions it would be reduced to 10 for sky and cloud, or to 9 for architectural and other similar subjects without sky or white portions.

“Similarly, in snow pictures or other very light objects the factor may be reduced to two-thirds or half normal.

“Mr. Watkins gives the following factors, which are here arranged in their ascending order:—

5 Adurol.	10 Ortol.
5 Quinol.	12 Diogen.
6 Imogen sulphite.	18 Amidol (2 gr. per oz.)
7 Glycin.	20 Edinol.
9 Eikonogen.	30 Metol.
10 Kachin.	40 Rodinal.
10 Pyrocatechin.	60 Diamidophenol.

Pyro-soda or Pyro-potash Developer:—

Grains of pyro per oz.	Factor without bromide	Grains bromide per oz.	Factor with bromide.
1	18	$\frac{1}{4}$	9
2	12	$\frac{1}{2}$	5
3	10	$\frac{3}{4}$	$4\frac{1}{2}$
4	8	1	4
5	$6\frac{1}{2}$	2	3

“Generally we may observe that with the given quantities of bromide the factor is reduced to about one-half. Thus with a 4-grain per oz. pyro we have a factor 8, and by the addition of 1 grain of bromide the factor is reduced to 4. But the time of appearance will be different in the two cases.

“Mr. Watkins, as the result of an exhaustive examination of different developers, sums up their comparative showing as follows:

Effect on speed of plate,	Differences slight, doubtful.
Searching out detail,	“ none.
Ultimate density power,	“ “
Foggy propensity,	“ “
Effect on different gradations,	“ “
Speed of working,	“ great.
Appearance of image,	“ “

Hence it is a mistake to suppose that one developing agent has more detail-searching power than another, when all are used free from bromide. If sufficient time be given they will all give the same amount. Similarly as regards density-producing power. In the case of pyro used with little or no soda sulphite or other preservative, we get in addition to the ordinary gray or black silver image an organic image of a greenish or yellowish color. These two together have a total density greater than that produced under the usual conditions.

General Con- “(1) The factor depends upon the
clusions developer and not on the formula (pyro and amidol are exceptions).
See page 350. (2) Varying the quantity of water (dilution) or alkali, or restrainer (bromide), may alter the time of appearance, but does not alter the factor. (The quantity of bromide materially affects the pyro factor and probably other short factors, such as quinol, but has little, if any, effect on long factors, like metol.) (3) Temperature affects the time of appearance, but does not modify the factor.”

Confirmation We are now familiar with the principles underlying the Hurter and Driffield system, and we have a method of development broadly in accordance with this system. We have also familiarized ourselves with the Watkins

method, using the "time of appearance" of the image as a guide to the time factor governing the duration of development. It is not to be expected that methods so completely revolutionizing the old traditions of development should be at once and everywhere accepted. The claims made by Messrs. Hurter and Driffeld and Mr. Watkins have, in fact, been hotly contested by many practical workers since their first introduction. The passing years, however, have brought more and more evidence demonstrating the correctness of the theories underlying the Hurter and Driffeld system. Thus the exhaustive experiments of Messrs. Mees and Sheppard, as given in the *Journal of the Royal Photographic Society*, July and November, 1904, at every point confirmed the results attained in the Hurter and Driffeld system. The very practical success of the Kodak Developing Machine is another convincing proof that the most rational method of development is one in which time and temperature are the controlling factors. Were we to analyze the psychology of the methods of exposure and development commonly employed by intelligent professionals, it would be still further apparent that all unconsciously the professional is working on lines approximating those laid down in the Hurter and Driffeld system. Thus, the professional is everywhere favored by uniformity of conditions in the illumination of his subjects, in the range of light-intensities encountered in his subjects, in his development formulæ and in his methods of development. Working under these approximately constant conditions he unconsciously perhaps, but still practically, acquires a sense or

intuition which enables him to control his exposures so that they always fall within the straight portion of the characteristic curve of his plate. By the same intuition he is guided in controlling the duration of development so as to give him negatives in which the opacities of the gradations are approximately proportional to the light-intensities in his subjects.

**The Tentative
Method**

Turning now to the traditional systems of development, it will perhaps interest the reader to have a clear explanation of the tentative system, wherein development proceeds according to the indications of under-, correct or over-exposure given by the appearance of the negative in the earlier stages of development. The method here given is sent me by Mr. Gaston M. Alves, who claims that neither the "time and temperature," or "time of appearance" methods can be considered as wholly rational or scientific. I quote: "In any art, the sooner we learn to depend upon our physical senses and a discriminating judgment for each particular detail which comes before us, the sooner will we acquire a real skill in that art. A slavish dependence upon hard and fast rules and machine methods will only end by making us indifferent artisans, to say nothing of artists.

"In a rational method of development, we must know what we ought to do in each particular case, be familiar with the approved means of bringing it about, and at all times see what we are doing. What follows is not new, but, on the contrary, about as old as photography itself, although it is not always presented in print in the most syste-

matic way. In this regard, we will endeavor to do the best we can.

“The following facts should be familiarized: 1. Over - contrasty scenes should be so developed as to soften and minimize the contrasts. Portraits, even though not contrasty, should usually be developed in the same manner. 2. Scenes lit by dull and diffused lights should generally be so developed as to emphasize and heighten what contrasts there are. This only partially applies if the spirit of the scene is quiet and restful. If its spirit is meditative or solemn or weird, it will hardly apply at all. 3. In general, strong developing solutions tend to vigor and contrast, while weak ones tend to softness and lack of contrasts. 4. Other things permitting, cold solutions tend to contrasts, and warm ones to softness. 5. Potassium bromide in a developing solution tends to increase vigor and contrasts, and rightly used will annul a large amount of over-exposure in the plate. Accelerators, carbonate of soda, etc., tend to the production of softness, too large a proportion producing chemical fog; rightly used, they are a material aid in under-exposures. 6. Within limits, the longer the duration of development, the greater the amount of contrast secured in the negative. 7. Among developing agents, pyro and its class tend to vigor, while metol and its class tend to softness. 8. Over-exposure tends to flatness, lack of contrast, softness. Portraits are usually better well exposed. To over-expose a ‘contrasty’ scene with the view of reducing its contrasts is not good practice, as halation and other troubles are apt to

result. To over-expose a dull scene is but to increase its dullness. 9. Under-exposure tends to contrast, giving 'chalk and soot' effects. To slightly under-expose a dull scene so as to heighten the contrasts is often good practice.

**Light
to Work by**

“Before proceeding to apply these facts in a rational and practical system of development, we must first consider the illumination of the developing room. It was said above that we must see what we do. We will therefore need a generous supply of light in order to plainly note the behavior of the plates in the solutions. Many photographers are timid about their light and, as a consequence, do more harm to their plates, by not being able to watch them than a much greater amount of light could possibly do. We are frequently told that no light is absolutely 'safe' or non-actinic; but this is only dealing in absolute terms. We know in an absolute sense that there can be no such thing as a complete absence of light, even to the unopened plates in their box. What we need is a practical answer to the question: How much light can we use without fogging our plates? If we will put this to a simple test, we will find it to be much greater than many seem to imagine. We need for our dark-room window at least a square foot of ruby glass, and this should be covered with thin oiled post-office paper. There should be placed behind this window a light sufficient to enable us to read a newspaper with ease at a distance of eighteen inches.

Caution

“Of course, we should not needlessly expose our plates to this light. In handling them when dry, we should

do so only in the shadow of the red light. When, however, they have been in the solution for as long as 15 or 20 seconds, they are much less sensitive to the light. We can then without fear examine them immersed in the developer at a distance of about eighteen inches from the ruby glass. In the later stage of development, when we need to judge the density and contrast, we can freely take them out of the solution and hold them quite close to the red light. At all other times we should keep our plates covered.

Pyro-Metol “We can now proceed to the developing. There are many good developing agents, but we will here use only pyro and metol. These we will have made up in concentrated solutions, and we will also have a bottle containing a ten per cent solution of potassium bromide, with a quill through the stopper to serve as a ‘dropper.’

How to Use the Method “If we knew that a plate was properly exposed, we could put in it a normal-strength pyro developer, and by simply rocking it let it develop itself. In removing the plate, we would be governed by the density and contrast required. If the scene was ‘contrasty,’ we would soften the negative by not letting it develop too far. If it was dull, we would prolong development, so as to increase the contrasts. Again, if we knew that the plate was over-exposed, we would put it in a rather strong and cool pyro solution, well restrained by bromide. Or if we knew that the plate was under-exposed, we could use a weak solution of pyro and metol with a slight excess of alkali, and thus coax

out the detail. But we are not always sure of these things. In our diversified exposures we cannot always know whether they are under-, correctly or over-exposed. We need to test them by the developer. If we tested them by a normal or strong developing solution, an over- or an under-exposure would perhaps get beyond our control. An over-exposed plate, which rushes up in a strong solution, had as well be left to blacken up until it gets its proper gradation and contrast, trusting to the efficacy of reduction for its improvement. An under-exposed plate which goes too far in such a solution had best be cast aside. Therefore we should test our plates in a weak solution which we can sufficiently control, in order to correct any errors made in exposure. Of course, it is not like putting the plates in the proper solutions at the start, in which case very great aberrations in exposure can be corrected; but in the weak solution it is quite safe to say that aberrations from 1 to 64, or 8 on each side, can be controlled so as to produce acceptable negatives. If we cannot keep within these limits of exposure, we then need to make some study of that subject.

**Testing
in Weak
Solution**

“Let us now test a plate in the weak solution. We will make up a pyro developer, $1\frac{1}{4}$ grains to the ounce and without bromide. We pour this on the plate and rock the tray. If our plate comes up in about the usual time, and begins to build up density in a regular and orderly way, we see that the exposure was about correct and double the strength of the solution. As the development nears the end, we examine the plate

from time to time, holding it up near the ruby glass. If the scene is a 'contrasty' one, or if it is a portrait, we do not allow the development to proceed too far, as we want softness. If the scene is dull, we push the development further in order to increase the contrasts.

Over-exposure "But let us suppose that the plate was slightly precipitate in the appearance of the image and in its building up. We then see that it was slightly over-exposed. In this case we add a few drops of bromide to the solution and, after rocking the tray, double the strength of the solution, as before. If, however, the plate showed considerable over-exposure, we quickly place it in a tray of water with bromide and proceed to increase the strength of the solution two or three times, at the same time dosing it with the bromide. We now remove the plate to the developer and allow it to complete its development.

Slight Under-exposure "Let us suppose again that, instead of being normal or over-exposed, the image was slightly sluggish in appearance, showing a slight under-exposure. In this case we will not double the strength of the solution, but instead may add a small amount of alkali, and leave the plate for development. If, after the detail is well out, the plate is slow in acquiring the necessary density, more pyro solution may be added.

Much Under-exposed "Again, let us suppose that the plate showed very considerable sluggishness. We then see that it has been considerably under-exposed. In this case we

place it in a tray of clear water and, emptying out the developer, make a fresh solution containing $\frac{1}{2}$ grain of pyro and $\frac{1}{4}$ grain of metol per ounce, with a slight excess of the alkali. In this we place the plate and let it take its own time in development. If, after all of the detail is out, there is a lagging in its reaching the proper density, more pyro may be added to hasten matters.

“In these simple ways we may successfully handle any exposure we shall be likely to make. Of course, in it all, we must bear in mind the nature of the exposure and what we ought to get in the negative. The method is not offered as the quickest one, but as a rational one,—not *the* but *a* rational method. Any method which will take care of all of the facts in the case is all right. The developing agents employed above are good, and serve our purpose, but others are doubtless just as good if their use is understood.

“It was stated in the foregoing
Great Aberrations in Exposure that very great aberrations in exposures could be corrected in development, if the plates at the start were put in the proper solutions. It may be of interest to the reader for the writer to state that he exposed plates 20 times under the normal, and others 40 times over—a range of 1 to 800—and produced photographs among which professional photographers could not tell which were over and which under. We frequently hear it said that nothing can be done with a plate which has had too little exposure. It is doubtful if any man can set the limit at which a slight exposure can be developed. The under-exposures just mentioned,

when referred to a lens working at $f/5.6$, would be represented by $1/1600$ of a second. The writer here enters a remonstrance against the prevailing tendency to over-exposure. The studio is another matter; but for outdoor work, the common vice is over-exposure. An ideal outdoor exposure is the quickest time that will give a negative of good gradation and density without undue work and time in its development.

“As a basis, $1/25$ of a second, with stop $f/16$ with an average scene, at the noon hour with brilliant sun and in the latter part of June will be found not far off. Of course there will be wonderful increase for other conditions.”

Here we make an end, leaving, as **The End** is inevitable in any discussion of development, more unsaid than has been said. The point of view throughout the earlier pages will doubtless be new to many into whose hands the book will come. I can only repeat what was said in the beginning of the excursion. The abandonment of the old, familiar ways and the starting anew with modern methods may be regarded with disfavor and involve some minor difficulties. But, once fairly tried, the new way will prove itself abundantly worth while and a decided step upward and onward.

BOOKS

THE PHOTO-MINIATURE, No. 56. *The Hurter and Driffield System*. 1903. 25 cents.

Manual of Exposure and Development. By Alfred Watkins. 1903. 50 cents.

Notes and Comment

According to a paragraph going the round of the British papers, Lord Avebury, better known to Americans under his former title as Sir John Lubbock, was the first person to have his photograph taken in England. The story runs that when Daguerre went to London to patent the process which bears his name, he visited Lord Avebury's father. It was then that the child posed for the portrait in question.



Mr. Henry Rankin Poore, the author of the monograph given in THE PHOTO-MINIATURE No. 64 on "Figure Composition," announces three lectures on art, adapted to the requirements of art classes, photographic organizations and literary clubs. The first lecture concerns "The Mechanics of Pictorial Structure. The Forms of Linear Construction and their Adaptation in the Art of the Old and the Modern Masters." The second lecture deals with "Balance in Composition. Chiaroscuro—the Idea Developed by Light and Dark"; and the third lecture has for its subject "The Picture Sense: Æsthetic Principles Applied." Inquiries concerning this course should be addressed to Mr. Henry R. Poore, 45 Ridge street, Orange, N. J.



G. Gennert, 24 East 13th street, New York and Chicago, has charge of the distribution of *The British Journal of Photography Almanac* for 1905 (American edition), and *The American Annual of Photography for 1905*. Both annuals have "sold out" in recent years as fast as they appeared, so that those who desire copies of the new issue should at once order through their dealer. In view of the fact that the editions are limited, dealers are requested to place their orders with G. Gennert as early as possible.

A new sensitizer, known as Etchine, is being introduced by Burke & James (Chicago and New York). Etchine is a universal sensitizer. Any kind of material can be coated with it,—paper, cloth, silk, wood, etc., and the print so obtained can be toned with any toning preparation, single or combined, gold or platinum, or it need not be toned at all, but simply fixed in hypo, the finished print varying in effect according to the method. The use of Etchine is so simple that even an inexperienced amateur can obtain good results with it. Its application to photographic postal cards, letter-heads, illustrated handkerchiefs and sofa pillows, can readily be understood. We propose to spend an hour or two with this wonderful sensitizer, and thereafter report to our readers its performance in our hands.



The Bausch and Lomb Optical Company, Rochester, N. Y., has just placed on the market the new Zeiss-Tessar *f*/6.3. This is the most recent production of the famous staff of scientific experts at the Zeiss Works, Jena, and is an unsymmetrical doublet of four thin lenses, the rear pair cemented, the front pair uncemented. This construction gives an objective of remarkable light-gathering and light-transmitting power. According to the manufacturers, the characteristic feature of the Tessar is its rapidity, combined with its perfect definition over a field of wide angular extent, giving an image uniformly sharp from the center to the margins of the plate. Its compactness and moderate price are also recommendations which will appeal to the amateur. Full information can be had from the manufacturers on request.



That indefatigable enthusiast, Mr. N. C. Hawks, of Alameda, Cal., is as indefatigable as ever in his perfecting of Polychrome, the printing process which gives engraving-like prints. In a recent letter Mr. Hawks favors us with a copy of an engraving, printed on Polychrome paper, which more closely resembles a copper-plate etching in color and general characteristics than any photographic copy of an etching we have yet seen. Polychrome deserves all the good things said of it by its inventor and his fellow enthusiasts. Those who want something special in the way of a printing paper for exhibition purposes should not overlook the suggestion here given.

THE WATKINS FACTORIAL METHOD.—The following letter from a subscriber with reference to the use of the factorial method of development in special cases, and Mr. Alfred Watkins' reply thereto, will doubtless interest many of our readers :

"Gentlemen:—I have lately been experimenting some with the development factor system, and find that, taking everything into consideration, one can get more good negatives that way than in any other, excepting under- and over-exposures, which I still give special treatment according to the circumstances.

"I lately returned from a vacation, however, with six dozen plates—a good big job in hot weather—and found some difficulty in using the factorial system and handling several plates at one time. If in your 'Notes' you would some time give a method of doing this, I believe it would be appreciated by others as well as by myself.

"Another thing occurs to me: When taking pictures against and from the sun, the same factor will not always work out, as for instance, a house or barn is taken with the sun or light behind, perhaps shaded by a cloud; if exposure sufficient is given to get good detail in the house (with perhaps objects in front) the sky will become far too dense if one calculates according to the time required for the appearance of the *image*—not the sky.

"Yours truly, J. W. LITTLE."

"Dear Sirs:—In reply to Mr. Little's queries, I have often developed a number of plates in a dish together, and always take for the time of appearance the *average* sky high-light, letting go any specially over-exposed high-light, such as the window in an interior. I have developed together landscapes, interiors and snapshots in this way with good results, giving the same time of development to all.

"I do not quite understand Mr. Little's last query. The time of appearance should always be taken from the sky, not the general image, and this is the case whether the sun be in front or behind. He almost seems to be putting an imaginary case. Yours truly,

ALFRED WATKINS."

A few days after the receipt of this letter, Mr. Little sent us the following account of his experiments along these lines, and we transcribe his letter for the benefit of those interested.

"Replying to yours, the results of my experiments thus far have not been thoroughly satisfactory in demonstrating the feasibility of Mr. Watkins' plan, by which he proposes

to develop several plates together by the factorial method, basing the total time for development upon the average time required for the appearance of the image. It seems to me that the case simply resolves itself into one of machine development, and is contrary to the doctrines of Mr. Watkins himself as set forth in his little book, in which, if I remember rightly, he claims to do away with guess-work, resulting too often in over- and under-development, neither of which can be avoided by the method he proposes, unless the exposures be fairly uniform, and the plates of a kind that allow great latitude.

"I have been experimenting some myself in this matter and have found the following method quite practicable, although in other hands it might be improved upon considerably:

"In the first place, unless the plates are color-sensitive, have an abundance of light in the dark-room, so that at all times one can see just what he is doing and be able to read figures made with a soft pencil on white paper and at some distance from the light. If the room is lighted artificially, the lamp used should be a large one, such as that made by Carbutt, dispensing with the orange paper altogether and relying upon the protection afforded by the combination of orange and ruby glass, with which such lamps are usually fitted. I have found this to be perfectly safe in time development where the frequent examination of the negative is unnecessary, and the plate may be kept in darkness during the whole process of development. Use trays only large enough to accommodate the plates being developed, and provide a separate tray for each plate. Provide a cover of white cardboard (or a piece of white paper mounted on pasteboard or strawboard) for each tray and cut slightly larger than the tray; also one covering of orange or ruby glass.

"Suppose that it is desired to develop a number of 5×7 plates, say a half dozen to be kept in the developer at one time. Arrange six trays, say of dimensions 6×8 , in a row side by side, thus:

6 5 4 3 2 1

These should be some distance from, but well in the light. A small clock or a watch with white dial should be close at hand with dial lighted from the side light of the lamp, so that the hands may be easily seen. Commence by placing a plate in tray No. 1, and pour on the developer, which, for convenience in making calculations, should be adjusted to the double sextuple method of timing, as explained by Mr.

Watkins in his little book. The Cramer pyro formula answers every purpose. Cover the tray at once with the orange or ruby glass covering, and through this watch for the first appearance of the image. If ruby glass is used, it may be necessary to remove it occasionally in order to discern the faintly appearing image, but in any case it should be kept between the light and the tray during this operation. As soon as the image appears, calculate the time the plate will require to be fully developed. Then remove the glass covering from the tray and quickly replace it with one of the white cardboard coverings, noting in plain figures on the upper end of the covering the exact time at which the plate should be taken from the developer. For instance, suppose a plate is put into the tray at 30 minutes and 30 seconds past 10 o'clock, the image appears in 40 seconds, and the factor is 12. As the plate will require 8 minutes to develop, the notation to be made on the cardboard covering would be 38.30 (dispensing with the hour), indicating that when the hands of the clock point to 38 minutes and 30 seconds past 10 o'clock the plate will be ready to remove from the developer. As a few seconds or even half a minute either way is of but little consequence, the seconds may also be disregarded, making the notation on the covering simply 38 minutes and making it unnecessary to watch the second-hand of the clock.

"As soon as this plate is under way in the developer, remove the tray to the position of tray No. 6 and slide all the trays to the right, so that tray No. 2 will occupy the position originally occupied by tray No. 1. Now proceed to put a plate in tray No. 2 in the same manner as before, following with trays Nos. 3, 4, 5 and 6, until tray No. 1 resumes its original position, rocking the trays occasionally and removing therefrom the plates from time to time as the time for their development, as marked on their respective coverings, matures, canceling the figures on the coverings and refilling the trays with undeveloped plates. The order of sequence in refilling the trays may, of course, be modified, depending upon the time required in developing previous negatives.

"The above may seem bewildering at first, but is all very simple in practice. I have found no trouble in handling six plates at one time, although it might not be advisable for a beginner to try more than three or four.

J. W. LITTLE."

Mr. Julius C. Strauss, of St. Louis, has been honored with the ribbon of an officer of the French Academy. The honor was awarded by the Ministry of Public Instruction and Fine Arts in France, the decoration being delivered to Mr. Strauss by an officer of the French government connected with the French exhibit at the World's Fair. The award is for notable work in photography and the fine arts.



It is a well-known fact that few improvements have been made in professional apparatus during the past few years, the cameras, etc., used by photographers in their skylights being very much the same in form and make-up as have been used since the beginning of photography. We learn, with interest, that the Century Camera Company, of Rochester, having apparently done their utmost in perfecting amateur apparatus, are turning their attention to the improvement of professional apparatus. Doubtless in their hands wonderful things may be expected. Already we have been favored with an illustrated description of the Century Studio Outfit, for which the following new features are claimed :

Focusing handle, which locks the camera automatically at any desired point, no clamp screw being necessary as with other makes. This handle gives extensive leverage, permitting the largest camera to be focused with perfect ease.

A draw-knob, so fitted that one operation loosens, draws out and locks the back frame of the camera. In other models it is necessary to loosen milled heads and then grasp the rear of the camera in order to draw it out.

The bearings of the swing adjustments in the Century outfit are double pivoted, which avoids any cramping of parts in adjusting the swings, also ensuring quick and accurate adjustment.

A double-acting screen hinge, which allows the focusing screen to open flat against the side of the camera, entirely out of the way, thus allowing the holder and automatic attachment to be readily fitted. The camera is made of selected mahogany and cherry, of superior workmanship throughout, and has a focusing capacity of forty-five inches in the 11 x 14 size.

The Century-Benster Holder, fitted with an improved light-proof curtain slide, constructed of slats which lap over each other, forms part of the equipment. The surface of the holder has no projecting parts and is held in a deep

rabbit at the back of the camera by a tongue fitting in the groove of the holder. This method does away with bothersome pins or cut-outs, which are liable to give trouble in manipulation. The curtain-slide of the holder runs over rollers, by which friction and wear are reduced to a minimum. At present the Century studio outfit is obtainable in 8 x 10 and 11 x 14 size. Full particulars can be had from most dealers, or direct from the Century Camera Company, Rochester.



A remarkable method of making photographs in colors was described in an equally remarkable way in the *Chicago Sunday Record* recently. We quote "The new paper is black. It stays black while the sunlight prints its rays into it. Therefore, you cannot watch the progress of the printing, but must use the photometer.

"If we could examine the manufacture of one of these magic slips of photographic paper, we would see that it is covered with ten layers of chemical coatings. These ten layers of chemical coatings are separated each from the other by coats of soluble gelatine. Each layer of chemical coating corresponds to the length of a certain light ray, that is to say, to a certain shade of color.

"You can thus see how the light-waves, attacking the chemical layers more or less profoundly, work to produce colors. According as the waves act, thus producing red, blue, green, etc., their vibrations are more or less stopped in their passage through the layers." Which explains how it is done!



In his new work on three-color photography from nature, Dr. A. Miethe refers to the fact that he uses the Wynne Infallible Exposure Meter in his work, as a convenient instrument for providing comparative exposures with accuracy. He also gives tables for use with commercial orthochromatic and bathed ortho plates, giving the photo-meter time for each in various conditions, and with different stops. This endorsement of the Wynne Meter by so high an authority as Dr. Miethe should be gratifying to its manufacturers. The Wynne Meter is represented in this country by Henry Wenzel, Jr., 237b S. Fourth St., Brooklyn, who will gladly send full information on request.

Books and Prints

"Mountain Photography." Mr. F. Achard, who has had many years' experience in this line, gives a résumé of his methods in the *Photo-Gazette*. He has worked largely among the Alps, particularly in winter, and above the snow-line in summer.

He recommends a strongly built camera of 9 x 12 centimeters—about $3\frac{1}{4} \times 2\frac{1}{2}$ —arranged to be carried, well protected from moisture, as a knapsack. Preference is expressed for independent plate-holders, as permitting different sorts of plates to be used, according to the particular requirements of the case. As he well says, three double holders will accommodate as many plates as one can expose in a day, if the subjects are at all carefully chosen. A changing-bag and reserve stock of plates provides for emergencies.

A telescopic metal tripod, a good single lens and a fairly rapid shutter, with orthochromatic plates and, on occasion, yellow lens-screens, complete the equipment. Short exposures are necessary—based upon the full aperture of the lens, which are relatively lengthened, by diaphragming down, and by the use of the yellow screen.



FERRET, ABBE J. *La Photographie par le Collodion* (Photography with Collodion). Pp. vii + 63; 5 x 7 in.; 1904; Paris. Gauthier Villars et Cie. 1 fr. 50.

This little work, by the curate of a French village, gives the essentials of wet collodion manipulation in untechnical language, and is evidently the outcome of practical experience.



VIDAL, LEON. *Traité Pratique de Photochromie* (Practical Treatise on Photochromy). Pp. vii + 337; 5 x 7; with 96 illustrations and 14 plates in colors. 1904. Paris. Gauthier Villars et Cie. 7 fr. 50 cents.

It is a pleasure to peruse such a lucid and comprehensive exposition of the principles which underlie the art of

color photography—for science it cannot yet be definitely called, notwithstanding the highly scientific knowledge its actual investigation demands.

The position of its author, as professor in the French National School of the Decorative Arts, and his reputation as a brilliant and fecund writer on photographic topics, give all the weight of authority to his presentment of the subject. He himself modestly disclaims any other purpose than that of presenting, in a popular manner, the general results of the investigations of the workers on this field, among whom he is numbered; and it is only justice to say that he has admirably succeeded in his aim.

The diagrams and cuts of apparatus are satisfactory; and the principal plate in colors is a wonderfully brilliant and harmonious reproduction of a magnificent Sevres vase, in delicate tints.



We are advised that a new edition of Abney's *Instructions in Photography* is in preparation and that the book is to be entirely revised and considerably enlarged. This work has long been considered the standard text-book on photography, and its reappearance will be welcomed by students desiring something more than the beginner's handbook.



How many of our readers have seen or heard of *Snap-Shots*, an unpretentious little monthly published at 57 East Ninth Street, New York, and obtainable for a dollar a year? *Snap-Shots* makes no attempt at originality or fine writing and rarely mentions high art. But for readableness and practical information on every-day work we know of nothing better at the price. Make a note to write for a sample copy.



The Photographer, a weekly journal, edited by Juan C. Abel. \$2 per year. The Photographer Publishing Co., 26 East 21st St., New York.

By an unfortunate oversight our welcome to this new venture in the stormy seas of photographic journalism has been long delayed. By this delay we now have 30 issues of the magazine before us and thus obtain a fairly comprehensive survey of its scope and activities. The journal consists of 16 pages 9½x14 inches, printed on coated paper, with about a dozen illustrations per issue. Its reading matter is made up in equal parts of useful and timely articles on

photographic questions and the news of the photographic world.

The publication of a weekly paper for American photographers is a bold experiment, but thus far Mr. Abel has given us a live and readable journal. We hope that the enterprise will meet with the success it deserves.



The Pose in Portraiture (THE PHOTO-MINIATURE No. 2), after going through some eight editions in English, has been translated into French and Swedish for the photographers of those countries. The French translation appears as Part I of Klary's *Lighting and Posing in Photography*, and the Swedish version is being published serially in *Svenska Fotograf-Samfundets Tidskrift*, Stockholm, Sweden.



For the doing of things as they should be done commend us to the Photographers' Association of California, an organization of professionals having its headquarters in San Francisco. This Association is not yet three years old, but has already accomplished much of permanent value for its membership and made a record of which the entire craft may well be proud. Some proof of this appears in the *Souvenir* of the 1904 convention held at San Francisco, under the leadership of Mr. Otto Boyé. It is a charming bit of bookmaking, and in quality and style offers an example which other and older associations may follow with profit.



The American Annual of Photography for 1905. Edited by W. T. Lincoln Adams and Spencer B. Hord. 350 pages; 6x9 inches; 208 illustrations. Paper, 75 cents; cloth, \$1.25. G. Gennert, New York and Chicago.

By virtue of the whirligig of time, or perhaps, the survival of the fittest, *The American Annual* is now the only American year-book of photography. The present volume shows a steady advance in quality of information, variety of interest and illustration, though we could wish for an increase in size of these latter. Enthusiasts in nature study will delight in the paper on photographing birds, by Gene Stratton Porter, while the notes on technical subjects by Henry Wenzel, Jr., will give pleasure to another class of readers. John Boyd gives a few useful hints on seashore work, and those who hanker after a home-made magazine camera will find specifications and diagrams on pages 209-214.

Laboratory Notes

Under this heading will be published from time to time notes dealing with special points or difficulties from the chemist's point of view.

HOW MUCH BROMIDE?

In working developing papers, one soon becomes acquainted with the fact that the amount of bromide in the developer is of very great importance,—in fact, of much greater importance than the amount of carbonate, sulphite or developing agent. We can double the carbonate, the sulphite or the metol and hydrochinon in the developer formula, and still get good prints, with clear whites and pure blacks, with careful manipulation. But if we try to do the same with the bromide, success is not ours. A little less than the right amount of bromide, and the whites are degraded or dirty and the clouds and sky are flat and lifeless. On the other hand, a slight excess of bromide produces greenish or brownish blacks, which are not desirable for most subjects. Nevertheless, we weigh out the grosser chemicals very carefully, and, when it comes to the bromide, “a few drops” is our measure of accuracy.

But why “a few drops” instead of a definite number? Because the amount required changes with any changes in purity of chemicals, especially sulphite. The developer requires less bromide if it has been standing for a time in a partly filled bottle. Different brands of developing paper require very different amounts of bromide in the developer. Different emulsions of the same paper sometimes require different amounts of bromide, and the same box of paper will not require the same amount when old and dry as when fresh and somewhat moist. The temperature of the developer may also be mentioned. Surely these seem to be a sufficient number of reasons, but let us ask one more question. Are we measuring our bromide by an accurate method? Are all drops of bromide alike?

To answer this question, the writer made a few measurements of drops of a 10 per cent solution of bromide of potassium. Drops from various containers were allowed to fall

into a graduated tube, and in this way several measurements were made for each kind of drops. The average results are as follows : drops from fountain-pen filler, diameter of point about $\frac{1}{16}$ inch ; average 10 drops equals .40 cubic centimeter ; average drop equals .40 cubic centimeter. Drops from chemists' thin glass beaker ; average ten drops equals .65 cc. ; average drop equals .065 cc. Drops from ordinary 4-oz. wide-mouth bottles ; average 10 drops equals .85 cc. ; average drop equals .085 cc. Drops from dropping-bottle with channeled glass stopper ; average 10 drops equals .95 cc. ; average drop equals .095 cc.

The largest drops are two and one-half times as large as the smallest. The writer can now understand why a certain manufacturer continually advocated a single drop of bromide per ounce of developer, while he always found it necessary to use three drops per ounce. The three were measured from a fountain-pen filler, and if the manufacturer had used the dropping-bottle, his one drop would have been nearly equal to the writer's three.

The lesson to be learned is, of course, that the drops of bromide must always be dropped from the same or similar lips or openings. The fountain-pen filler, which the writer uses exclusively, seems to give more uniform drops and is much more convenient to use than anything else he has tried.

ERNEST A. TURNER.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

OCTOBER, 1904

Number 67

Practical Orthochromatic Photography

There is a very wide difference between the practical and the theoretical sides of orthochromatic photography. The subject is one of universal interest, as it is unquestionably the photography of the future, but there are so many points of extraordinary interest to a limited number of scientific photographers in connection with it that are valueless to the practical worker, that the writer on color work must carefully sift out the *useful* from the *useless*. I shall endeavor in this short work on orthochromatic photography to make it eminently practical, but at the same time to discuss a theoretical point here and there which is of general interest, whilst I propose occasionally to devote a paragraph to the scientific reader which may or may not appeal to the general worker, and, in order to save the time of the latter, such paragraphs shall be marked with an asterisk.

Ortho
and Iso

It is hardly necessary to state in these enlightened times what orthochromatic photography means, though misconceptions frequently arise, and some confusion has been caused by the indiscriminate use of the two prefixes "ortho" and "iso." Orthochromatic and Isochromatic photography are one and the same thing, and mean the rendering of objects that are photographed in gradations corresponding to the luminosity of the colors of which they are composed.

Let us look into this a little more closely, so that we avoid all confusion.

If we photograph a landscape, we get upon the print a representation of the scene we saw, but it is in black and white or in monochrome, and lacks the brilliant colors that were actually there. Suppose for a moment that in the landscape there had been a bright yellow object such as a painted cottage. Would that cottage appear in the print also as a bright object which at once attracted the eye? Probably not; it would appear very dark and not at all noticeable.

Similarly, when photographing flowers, we find that in the print a blue flower will appear very light, and an orange or red flower almost black, whereas possibly to the eye the yellow flower would appear much *brighter* than the others.

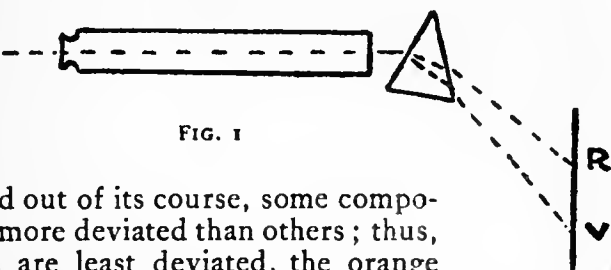
It is therefore clear that the camera does not recognize colors as we do,—that it has not the power to render the contrasts in monochrome that we see in the colors. Ever since one can remember, it was an understood thing that a blue object appeared white in a photograph, a red object black, and so on.

Hence we must take it for granted that photographic plates are color-blind, and that they lack the discriminating power of our own sight. Their fault is, moreover, a double one, for they not only appreciate blues far more than reds, but they further lack the power to appreciate bright colors in a greater degree than dark colors. You would say, for example, that yellow is a brighter and lighter color than violet. The dry plate, however, not only is not more sensitive to yellow than violet, but it is not affected by yellow at all!

The reason for all this trouble, which it is the rôle of orthochromatic photography to avoid, may be explained in a very few words, but we must first of all consider the question of light itself before proceeding to examine its effect upon the photographic plate.

White light consists in reality of rays of various colors, and is, therefore, a mixture. This mixture can be separated up into its several components, which are violet, blue,

green, yellow, orange and red. If a beam of light be passed from a telescope through a prism, as shown in Fig. 1, it will be split up into its component rays, and at the same



time deviated out of its course, some components being more deviated than others; thus, the red rays are least deviated, the orange rays a little more deviated, the yellow and green still more, the violet rays being the most bent out of their original path. This process is termed refraction, and the red rays are said to be the least refrangible, the violet rays the most refrangible. If we placed a sheet of white paper in the path of the rays, shown as *R V* in the figure, we should see these colors, one running into the other with imperceptible delicacy, and the band of colors would be called the spectrum.

Now just as a bright day has a more beneficial effect upon the average being than a dark, gloomy day, so rays of different colors have greater or less *chemical power*, and it has been found that as a general rule the violet and blue rays are more powerful chemically than the green and red. Although the spectrum as we see it begins with the red and ends with the violet rays, there are other rays at each end of it which are invisible to our eyes but are nevertheless very active chemically; those beyond the violet end are termed ultra-violet rays, and it is these rays which are largely responsible for the image on a dry plate.

What Happens in Exposure The film of an ordinary dry plate consists of an emulsion of silver bromide in gelatine, and the action of the light is to convert it into a physically altered compound which may be blackened by a developer. But the blue, violet and ultra-violet rays cause this conversion, so that we could take a photograph just as well in violet light as we could in white light.

If, then, the green, yellow and red rays of light are of no value to us, photographically speaking, we cannot

expect green, yellow or red objects to make much impression on a dry plate. They therefore appear as "dark shadows" in the negative, and come out in the prints as a black object would,—devoid of detail and half-tone, i. e., lacking in luminosity.

Sometimes this is not the case, and
The Effect of red and yellow objects appear in the
Reflection print in approximately correct contrast ; it is then sometimes thought that orthochromatic plates are useless, and give no better rendering of colored objects than do ordinary plates. But this is not the case ; the white light which is reflected from the surface of some objects when in a certain lighting is sometimes sufficient to cause their appearance in the negative, when otherwise, by reason of their coloring, they would hardly be visible.

I hope I have made it clear now that the ordinary dry plate is practically "color-blind," is insensitive to the less refrangible rays, and is thus entirely inadequate for photographic work where colored objects are concerned. The plate, to be ideal, should be most sensitive to those rays of light which appear to us the brightest ; it has therefore a two-fold failing,—it is affected only by violet and blue light, and it is not capable of showing in a photograph the color contrasts of the subject.

*Many makers of plates employ silver chloride in the manufacture of the slow varieties, in conjunction with the iodide and bromide of silver. Such plates are still less sensitive to colors other than violet, whilst the presence of a large proportion of iodide in an emulsion renders the plate sensitive to the bluish green rays in a small degree.

Having now shown the defects and failings of the ordinary form of dry plate,—and of course film,—we shall consider the ways in which it may be made to render every subject correctly in monochrome, as far as color is concerned.

Over twenty years ago it was found
The Use of that certain coloring matters had the
Color effect on dry plates of increasing their
Sensitizers sensitiveness to certain rays of light,
 and as a result of this discovery a great deal of ex-

perimental work was done, more especially with the dyes derived from the by-products occurring in the manufacture of gas and coal-tar, now generally known as aniline dyes. The experiments were carried out in two ways,—the dyes were either added to the emulsion with which the plates were coated, or ready-prepared plates were bathed in solutions of the dyes, and then dried again for use. The dyes which came into the greatest remark were certain salts of fluorescein, known as eosin and erythrosin; these two colors, when dissolved in spirit or water, give pink solutions which exhibit strong fluorescence, i. e., by reflected light the solutions appear of another color, in this case either green or yellow. Generally speaking, fluorescent dyes are more effective than non-fluorescent in their action on emulsions, but a certain class of dyes derived from cyanine have proved to be extremely powerful, although practically non-fluorescent.

Now, as we have already seen, an ordinary plate is only sensitive to the violet and blue rays of the spectrum. But a plate treated, i. e., dyed, with erythrosin, will be found to be not only sensitive to violet and blue rays of light, but to greenish yellow rays as well. In a similar manner eosin renders a plate sensitive to greenish yellow rays. A yellow dye, known as thiazol yellow, will cause the plate to be particularly sensitive to green rays of light. Cyanine blue, on the other hand, will render a plate so sensitive to red light that it will be fogged even on exposure to the dark-room lamp.

There is here, then, an endless field for experiment for those who wish to examine the *color-sensitizing* effects of the numerous aniline dyes nowadays made. Of a few only I shall have something to say; but we must first look into the matter of the means of ascertaining the precise effect of any one dye on a plate.

Mistaken Nomenclature It was a lamentable error on the part of the early plate-makers to call plates dyed with some aniline color “isochromatic” or orthochromatic.

The word isochromatic means equally color-sensitive. How, then, can a plate merely made sensitive to yellowish green rays of light by means of eosin be isochromatic?

The average iso- or orthochromatic plate on the market is simply sensitized by eosin or erythrosin for the yellowish green rays, and though, therefore, a great improvement on the ordinary plate, it has no claim to the title orthochromatic. With the aid of certain dyes of recent introduction, however, it is possible to render plates equally sensitive to green, yellow or red, so that plates truly isochromatic can be prepared.

But as the color-sensitiveness of each make of plate is slightly different,—often widely different,—it is necessary to place in front of the camera lens, when exposing these plates, a colored screen or filter, which *compensates* for their deficiencies, and also destroys the violet and ultra-violet rays of light to which *all* plates are abnormally sensitive. First, then, we will describe the manufacture of a color-sensitive plate, and afterward consider the matter of the color filter.

In order to test the color-sensitiveness of a plate, some colored object must be photographed upon it, such as a piece of cardboard upon which are pasted, side by side, strips of colored paper, preferably of the colors violet, blue, green, yellow, orange and red. White light is always reflected from the surface of such a color chart as this, and hence there is no more excellent way of testing the plates than by exposing them in a specially arranged camera

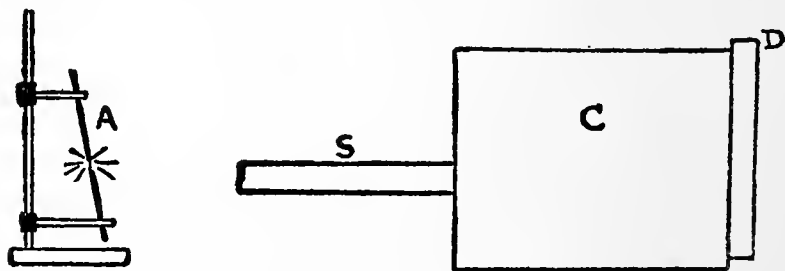


FIG. 2

such that the direct prismatic spectrum is cast upon the film. Look for a moment at Fig. 2. Here we see a spectroscope *S* fitted to a camera-box *C*, so that the spectrum of the arc-light *A* is cast upon the plate in the

plate-holder *D*. The plate-holder is generally arranged so as to slide along the back of the camera, thus enabling four or five exposures to be made on the one plate. A plate thus exposed to the spectrum and developed will

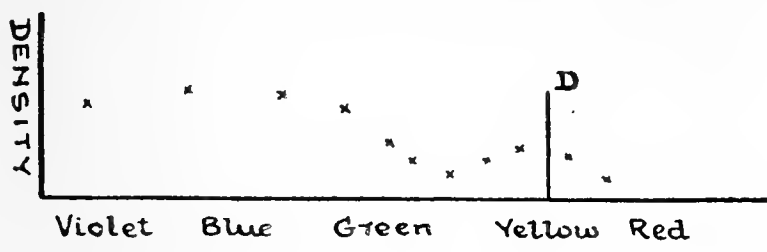


Fig 4

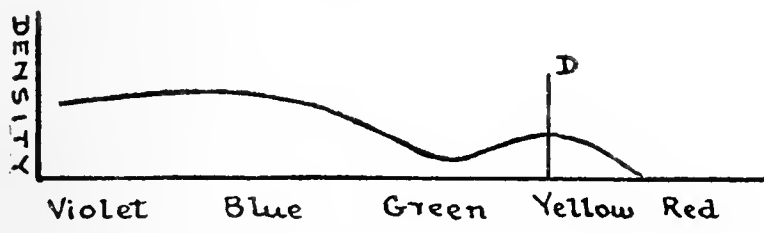


Fig 5

give a band of density varying in intensity according to the sensitiveness of the emulsion to the various regions of color. Thus an ordinary plate would be affected by the violet and blue regions, but not by any others, hence our "band" in the negative would end at the commencement of the green region.

If you will glance at Fig. 3, you will find the crude plan of examining the results. By looking at the spectrum with the eye we find it to be made up of regions of color marked *H*, *G*, *F*, *E*, *D* and *C*, these corresponding roughly to the violet, blue, green, yellow, orange and red portions of the spectrum respectively. Under this is the reproduction of a negative of the spectrum taken on an ordinary plate (*A*), whilst *B* represents a negative taken on an orthochromatic plate. We shall refer again later to this illustration and to *C*.

Suppose, now, that we divide up the spectrum into a considerable number of "slices," and read the densities of the portions of our negative which correspond to each slice, and measure them off in a vertical direction, at the same time measuring off the position of each region in a horizontal direction, so that we get a series of "points," as in Fig. 4. By now joining up these points, we shall get a *curve* (Fig. 5), representing the sensitiveness of the plate in question to the spectrum. Thus one brief look at Fig. 5 would tell us that such a plate as this curve represents is well sensitive to violet and blue, very little affected by green, and fairly sensitive to yellow, whilst not at all sensitive to red rays of light. Such a plate may be prepared by bathing an ordinary plate with a dye known as Rose Bengal (see p. 384).

As the designation violet, blue, etc., conveys but a rough idea of the region of the spectrum, it is the general plan to adopt a better system made possible by Fraunhofer, a scientist who discovered certain dark lines in the spectrum of sunlight which ever since bore his name. If we burn some salt in the flame of a spirit-lamp, Bunsen burner or arc-light, and look at it then with the spectroscope, we shall see a bright yellow line stand out with extreme distinctness. Similar metallic salts give similar bright lines; thus potassium salts give a special violet line (amongst others), thallium salts a green line, and so on. A number of these lines were, therefore, utilized, and their position in the spectrum designated by letters, beginning with *A* in the deep red; then *B* in the red, *C* in the orange-red, *D* in the yellow, *E* in the green, *F* in the blue, *G* in the bluish violet, and *H* and *K* in the extreme violet.

Hence, turning to Fig. 5 once more, we should describe the plate whose curve this is as being sensitive to the *H* and *G* regions, less sensitive to the *E* region, and sensitive to the *D* region of the spectrum.

All plates are sensitive, as I have already stated, to the violet and blue rays, i. e., up to about *F*. We, therefore, mean by "color-sensitizing" a plate "increasing its sensitiveness to the rays beyond *F*, thus making it more useful where color is concerned.

Bathing Plates I think I am now in a position to come to a more practical portion of the monograph, namely, the bathing, or *orthochromatizing* of plates. The foregoing theory is essential in order to quite follow all that is to come, and I have, therefore, been at some length to explain it in an elementary and clear manner. I shall now, therefore, refer to plates as being sensitive to certain Fraunhofer-line regions, and feel that by giving the curve of any plate I can convey to my readers an adequate idea of its color-sensitiveness.

Cleanliness: The success of home-made orthochromatic plates depends upon three things.
Safe Light Dishes and measures, etc., must all be kept scrupulously clean. Only slow brands of plates must be used for bathing. Drying must be done as expeditiously as possible in a warm, dry room free from dust. The apparatus necessary consists merely of a few clean dishes, preferably porcelain, two or three glass measures or beakers, a tap with constant water-supply, a drying rack and a safe dark-room lamp. By safe I mean a light which is *ruby*, not orange nor lemon-yellow. Orthochromatic plates being sensitive to yellow rays, it need hardly be pointed out that yellow illumination is impossible for the dark-room. The subject of safe lights will, however, be treated later on.

The dark-room must not be musty and damp; it is a very great advantage to have some means of heating it, such as a hot-water or steam pipe, but, as this is seldom attainable, an oil-stove may be allowed to thoroughly warm the room before operations are commenced.

Advantage of Slow Plates The reasons for choosing a slow brand of plate to be bathed are two-fold. In the first place, bathing increases the speed of a plate,—as a general rule,—and (with the exception of certain yellow dyes) it increases the fog; hence a slow plate is chosen, as it should be quite free from any tendency to fog. In the second place, the presence of silver iodide in an emulsion is calculated to work some confusion with certain dyes, especially in rapid plates, owing to the yellow coloration of the film produced. Slow plates, it must be admitted, contain iodide, but

the less digestion employed in their manufacture does not seem to render it prejudicial in any way.

As a preliminary example of color-sensitizing, we will make use of a bath of erythrosin—one of the oldest, but almost the best of the dye solutions ever used for sensitizing plates for the greenish yellow rays.

Erythrosin may be employed either

Erythrosin with or without the addition of ammonia, the greatest orthochromatic properties accruing from the use of it. Make up two solutions as follows :

A. Erythrosin, 25 grains ; Methylated or Columbian spirit, 10 ounces.

B. Concentrated ammonia (.880), 1 ounce ; distilled water, 9 ounces.

To prepare the sensitizing bath, take four ounces of distilled water, add a dram of *A*, and a quarter of an ounce of *B* ; this makes the ammoniacal solution. If quarter-plates are to be bathed, it will be found convenient to use a whole-plate dish and do four at a time.

In the ruby light the four plates are

Manipulation placed in the dish (of course, film upward), and the solution is flowed over them. It is a good plan to then cover the dish with a cardboard-box lid so as to exclude all light. The dish is kept gently rocking for three minutes, after which time the solution is poured away, and the plates washed ; the washing is performed by placing the dish under a gently running tap for two minutes, or else giving the plates at least six changes of water. The use of running water for a definite period gives more uniform results.

Do not be disconcerted at the thought of washing away the dye which you have just introduced into the film. An extremely small quantity of it unites, probably in some physical way rather than chemical, with the gelatino-silver bromide, and any surplus may be washed out without interfering in any way with the sensitizing action of the dye.

Having now washed the plates, they must be placed in a rack to dry, and then another lot may be proceeded with. In this way a dozen plates may easily be orthochromatized in half an hour, and when as many have

been bathed, washed and racked as is desired, the best plan is to leave the dark-room and lock it up for a few hours until they are dry. Means of leaving the dark-room without admitting white light into it are of course absolutely essential, and before leaving, the lamp should be turned low, or else right out; if turned right out, it cannot be relighted until the dried plates are safely repacked unless brought out and lighted outside.

Commercial Ortho Plates Plates rendered orthochromatic in the above way will be similar to the majority of so-called orthochromatic or isochromatic plates on the market. The commercial plates are, however, made in a different way, as the dye is then mixed with the emulsion of some stage of its preparation. It is a very interesting thing to note that the sensitiveness conferred by the dye is much greater in certain cases if it be added immediately after the emulsification, whilst with other dyes this increase does not take place.

Sensitizing for Various Colors The erythrosin plate, then, is a good orthochromatic plate of the ordinary type, and is especially sensitized for greenish yellow rays of light. But here I must again refer to the absurdity of employing the term "orthochromatic." Several dyes will now be discussed, as the practice of sensitizing plates by bathing has proved to be of exceptional interest to so many photographers, and each dye has a personality of its own, i. e., it gives to the plate a distinctive color-sensitiveness. There is obviously only one correctly sensitive plate, and this is the plate which is sensitive to all colors according to their relative luminosity. Such a plate is, I think, impossible except theoretically, and hence the most nearly correct plate is one which is equally sensitive to all rays of the spectrum of daylight,—or whatever light is to be used for photographing in.

Pan-chromatic Plates We can make a plate equally sensitive to blue, green, yellow, orange and red rays, but even then the violet-sensitiveness is so great as to require *correction*. This subject I shall deal with fully at a later stage. The total-spectrum sensitive plate, if I may call it such, has been more often termed a panchromatic plate, and to those who

want to make use of the greatest advances and advantages in orthochromatic work for color reproduction I would recommend no other.

But in landscape work and in some isolated cases, a plate specially sensitized for orange, for yellow-green or for bluish green, may be of advantage, and we shall therefore next learn how to make plates sensitive to various regions of the spectrum by bathing. The bathing is in each case carried out in precisely the same way as already described for erythrosin plates, and it will therefore suffice to set out formulæ for the various sensitizing solutions.

The various dyes here mentioned may be obtained from the Berlin Anilin Co., the Farbenfabriken of Elberfeld Co., or Eimer and Amend, of New York.

A. For bluish green rays. Thiazol yellow (Bayer's), 25 grains; water, 10 ounces. Make this up the day before using, and for use mix three drams of the solution with eight ounces of water and filter the mixture.

B. For continuous sensitiveness up to D. Auracin G (Bayer's), 2 grains; water (boiling), 20 ounces. When cold, filter and add six drams of the erythrosin solution given on page 382. This bath considerably diminishes the violet-sensitiveness of the plates, and consequently their speed also.

C. For yellow and yellow-green rays. Rose Bengal, 25 grains; methylated or Columbian spirit, 10 ounces. Use a dram of this to each two ounces of water for bathing. Rhodamin B (Bayer's), is a good substitute for Rose Bengal.

D. For yellow and orange rays. Orthochrom T (Meister, Lucius & Brüning), 5 grains; rectified spirits or alcohol 90 per cent, 10 ounces. For use mix one dram with eight ounces of water.

For red and orange rays. Cyanine blue or Pluto black are good sensitizers, but as it is more advantageous to use a dye which renders the plate *panchromatic*, the following is recommended:

E. Homocol (Bayer's), 1 : 1000 solution, 1 dram; water, 12 ounces.

*A very interesting color-sensitizer is one which is

abundant in nature, and this is chlorophyll, the green coloring matter of plants. A handful of blades of grass stewed in a little alcohol for half an hour will give a

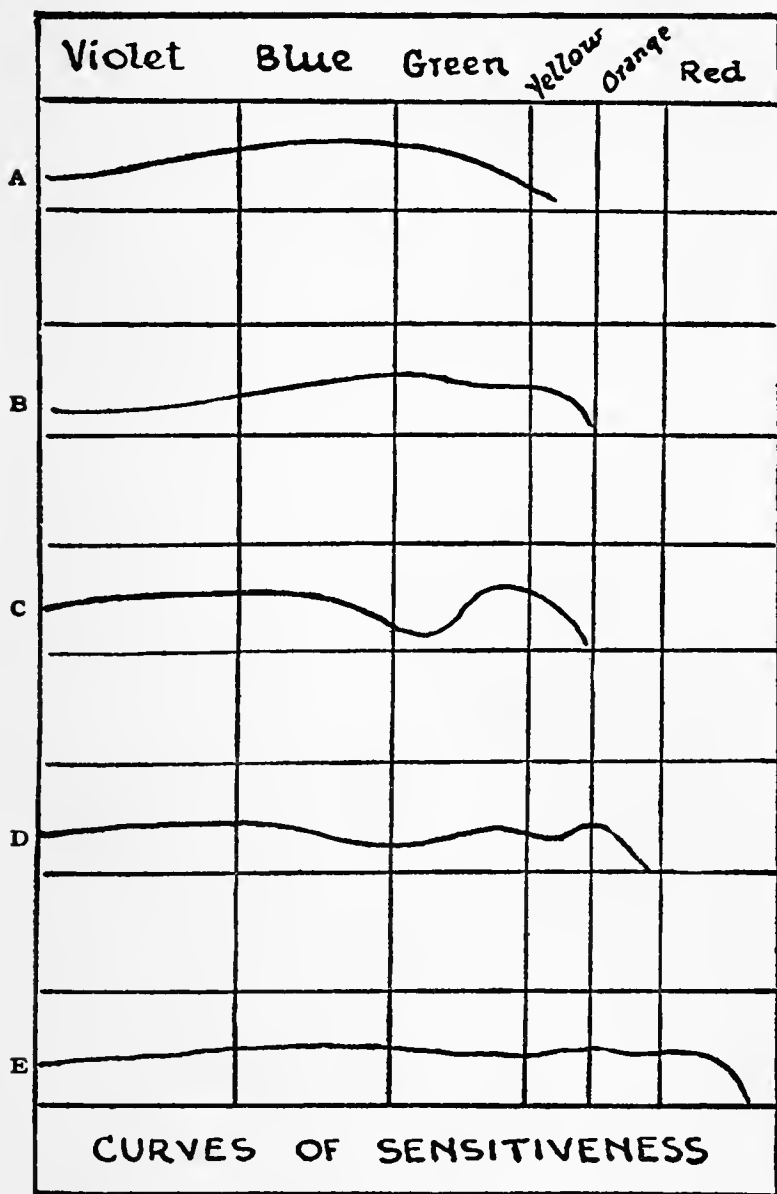


FIG. 6. (See page 386)

bright green solution, which may be used when diluted with water for bathing plates. The sensitiveness conferred is chiefly to the red and green rays.

Comparison of Formulæ I have indicated roughly in Fig. 6 the sensitiveness to the spectrum conferred by the baths given, and from these it will be readily gathered how much superior the *E* formula is. When, however, we make use of dyes which confer red-sensitiveness, we are at once thrown into a sea of troubles, for our only remaining kind of illumination for the dark-room is now denied us. A plate that is panchromatic, or red-sensitive, must be worked throughout as much in darkness as possible. Especial care must be exercised in the bathing and drying of the plates, and as little light as possible must be used during the loading of the dark slides and subsequent development. Such precautions as covering the dishes during development, etc., should be taken with all kinds of orthochromatic plates as a matter of routine.

Note on Sensitizers *Before leaving the subject of bathing plates, I shall make a few remarks on the general conditions and modern knowledge of sensitizing. A glance at the baths A to E already given will reveal the fact that yellow dyes sensitize for the bluish green rays, pink dyes for the greenish yellow, and violet dyes for the orange and red rays. Some exceptions to this general rule practically render it "not a rule," and the author has spent a good deal of time investigating the matter with a view to gaining some knowledge as to the general behavior of aniline dyes. As a result of numerous experiments it has been found that a great deal depends upon whether or not the dye is fluorescent, and that fluorescent dyes almost invariably sensitize the plate for the rays they fluoresce. Thus eosin in solution exhibits strong greenish yellow fluorescence, as does erythrosin, and plates prepared with both these dyes are rendered sensitive to greenish yellow rays. Similarly, fluorescin (of which eosin and erythrosin are haloid derivatives) sensitizes for the green rays, and in solution it exhibits remarkable green fluorescence. But when we come to dyes which are devoid of this property, their action is in most cases

different, and they more often than not sensitize the plate for the rays which they transmit. Thus cyanine, examined with the spectroscope, allows blue and red rays to pass through its solutions, i. e., its solution transmits these rays, and hence these are the rays to which plates bathed with cyanine solution are rendered especially sensitive. Wool-black, again, transmits all rays except the greenish yellow, consequently a plate bathed with wool-black solution is very deficient in greenish yellow sensitiveness. We may therefore, as a general rule, when experimenting with new dyes, expect them to confer sensitiveness to the plates to those rays which are complementary in color to their transmission spectra if fluorescent, and vice versa.

Testing Plates

To the photographer who bases his work upon sound scientific lines there is only one ideal way of testing the qualities of any orthochromatic plate, but for the majority of practical photographers there are one or two less accurate and more readily performed methods, to which I shall briefly refer. The ideal method is, needless to say, to photograph on the plate the actual spectrum, and to examine on development what regions of it are recorded. Thus, turning again to Fig. 3, we see a well-known make of orthochromatic plate (*B*) and a well-known make of panchromatic plate (*C*) "spectrographed," and from a comparison of the two it is readily seen that the *B* plate is sensitive to all rays except the red, i. e., from violet up to the *D* line, whilst *C* is red-sensitive also.

Supposing, now, that the luxury of a spectroscopic camera is not possessed, what simple means can we adopt to test the plate in some other way? That test the plate we must is obvious from the fact that *every orthochromatic plate, however good*, requires a screen or light filter to be used in conjunction with it, and that to obtain the best results the screen must be *adapted to the plate*. Before, then, we can discuss the making of our isochromatic screen or filter, it is essential that we become thoroughly familiar with the color-sensitive character of the plate we are going to use.

Let me here give utterance to a most urgent plea, and that is: "Select the orthochromatic plate of a well-

known maker and stick to it." Let it preferably be a panchromatic plate, examine its color-sensitiveness very carefully, adapt the light filter, and your results are then bound to be faultless.

I have already pointed out that a color chart is useless because of the white light reflected from the surface of all colored paper or cardboard. Such a method as this being therefore denied us, the next best is to construct, as simply as possible, a *color sensitometer*, which may be made at a very trifling cost in the following way: Obtain from a glazier four strips of colored pot or flashed glass of the size 1 inch by $3\frac{1}{4}$ inches, one dark blue or violet, one as nearly grass-green as you can obtain, another a deep yellow or orange, and the fourth ruby. Take a quarter-plate printing-frame, and in place of a

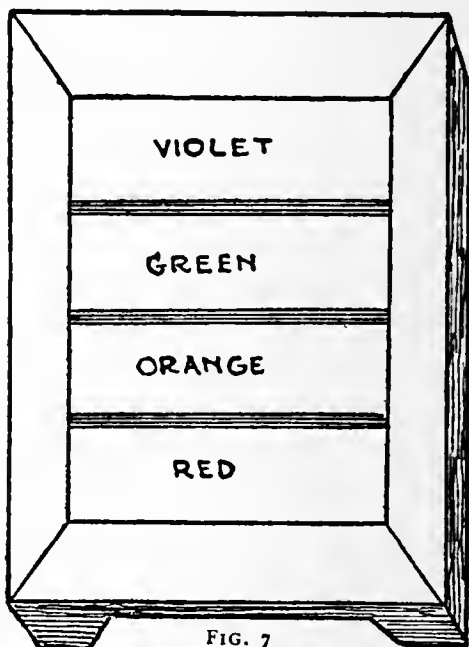


FIG. 7

negative put these four glass strips in it, side by side, fastening them to the rabbet with a little fish-glue. Paste a thin strip of black paper (about $\frac{1}{4}$ inch by 3 inches) along the edge of each two strips of glass, so that no light is admitted between them, and the front of the frame will then have the appearance indicated in Fig 7. If a certain make of orthochromatic plate is now to be tested, a plate may be exposed behind this set of "light-filters" in the printing-frame, or "sensitometer." The plate should be placed in the frame in the dark-room, and then exposed to candle-light or electric glow-

light for about ten seconds, at a distance of from two to five feet from it. This may be conveniently done by placing the "loaded" frame against a wall in the dark-room, on the bench, and then putting a candle a couple of feet away. The front of the frame is then covered with the lid of a cardboard box, and the candle lighted. When the candle is properly alight and burning steadily, remove the lid from in front of the frame for the requisite exposure, replace it, blow out the candle, and proceed with the development of the plate.

**What It
Shows**

A sensitometer-negative so obtained with an ordinary plate will show a dense deposit in the portion exposed under the blue glass, a less dense deposit in the green portion, little or none in the yellow, and none in the red. Some so-called ruby glass transmits green and yellow rays, and the commercial orange glass sometimes permits the passage of blue and green rays, so that the results one obtains with this crude sensitometer will depend on the glass selected. However, the tests will be purely comparative, and what chiefly interests us is the relative densities in the four portions of the negatives made on the ordinary and orthochromatic plates. For example, a negative made on an orthochromatic plate will probably give the blue, green and yellow portions each of about the same density, and the red considerably less dense. The glass strips, however, when examined with the eye, will probably appear as follows: the orange looks the *brightest*, the green and red seem about the same as regards brightness, or luminosity, and the blue the *darkest*. Consequently the negative we want to obtain should give the greatest density in the portion exposed under the orange strip, less but similar density under the green and red portions, least density in the blue portion.

This correct rendering of colors according to their luminosities can be obtained only by means of the light filter, and to this important factor we shall now devote especial attention.

**Color Filters
or Screens**

The many makes of orthochromatic plates now on the market are all good in their way,—some, of course, better than others,—but they one and all possess the deficiencies

which characterize plates color-sensitized by bathing with dyes. The blue-violet region of the spectrum of daylight is so intensely actinic compared with rays of other colors that, however well a plate may be sensitized for green, yellow and red rays, the blue and violet components of a picture will nevertheless generally record that picture before the other colored rays have had a chance to act.

What They Do The first function of the isochromatic screen is, therefore, to lessen the power of the blue-violet rays, so as to give the green, yellow and red rays more time to make their impression on the plate. The second function is to damp *all* regions of the spectrum to which the plate is comparatively over-sensitive, this being termed "compensation."

I will make this a little more plain in the following way. Suppose an orthochromatic plate is found, on testing, to be extremely sensitive to violet, blue and yellow, and comparatively much less sensitive to green and orange. In order to enable rays of all colors to act equally,—and *iso* means equal,—it will be necessary in some way to give the green and orange rays a longer time to act than the violet, blue and yellow.

Now, if you hold before the eye a piece of green glass, and then over it place a piece of red glass, you will find the combination of the two appear opaque, so that you cannot see through it. Any two colors which act in this way are said to be complementary to one another, because each one consists of exactly the rays of which the other does *not* consist. Thus yellow is complementary to blue, and so on.

We must, therefore, contrive to let the color of our isochromatic screen be complementary to the colors to which the plate is most susceptible. Thus, if working with the above-described plate, which is extremely sensitive to violet, blue and yellow, the orthochromatic screen should be of (i) a yellow color to absorb the violet and blue rays, and (ii) an orange color to admit comparatively more orange rays than any other, the plate being least sensitive to orange.

The isochromatic screen, then, consists of a colored glass or stained film, which may either be placed in front

of the lens or placed in direct contact with the plate. (The latter method is very unusual except in the case of three-color photography.)

"Damping" the Blue-violet All orthochromatic plates being usually susceptible to blue, violet and the ultra-violet rays, the isochromatic screen is essentially *yellow in color*, as rays of these colors are destroyed entirely or partially, i.e., "damped" by transmission through a yellow, and therefore complementary, medium. In any region of the spectrum to which the plate is comparatively insensitive, the isochromatic screen must be made more luminous.

Such being the essential properties of the screen, we can now proceed to the practical manufacture of one for our own personal use. I must remark first, however, that a commercial screen, unless specially adapted to the brand of plate you are using, is not likely to be correct. If we are going to the trouble of employing isochromatic plates and screens in order to obtain a correct rendering in monochrome of the objects we photograph, it is no use going half way, i. e., using the right plate with the wrong screen; we may just as well do the thing correctly or not at all. Consequently, although a yellow screen used in conjunction with our orthochromatic plate will give a markedly different result from that obtained on an ordinary plate and (of course) no screen, it is quite possible for one result to be as wrong as the other unless the screen is adjusted to the plate.

Screen for Commercial Plates. The majority of commercial orthochromatic plates are similar in color-sensitiveness to those bathed with erythrosin (bath A): their violet and blue sensitiveness is diminished, they are extra sensitive to greenish yellow, and deficient in bluish green sensitiveness. For general work with such plates we may prepare a screen or "light-filter": (i) the economical but imperfect way, by staining a fixed-out lantern plate; or (ii) by staining a gelatine film prepared on optically plane glass.

Screens by Staining (i) The isochromatic screen consists of a piece of glass coated with some stained material, such as collodion or gelatine. The experience gained during innumerable

trials of color filters has led me to advance the suggestion to use gelatine in preference to collodion. An ordinary lantern-plate consists of a piece of glass coated with slow bromide emulsion, and if, without exposure to light, such a plate be fixed in a bath of three ounces of hypo to the pint of water, and then very thoroughly washed and dried, we shall have our glass coated with a film of gelatine which we can then stain with the requisite dyeing solution.

You will readily understand, however, that as the light-filter is placed in front of the lens, any irregularity in the glass may cause distortion of the image. It is, therefore, as well to select a lantern-plate which appears quite free from bubbles, curvature or scratches, and throughout the whole of the operations to keep the surface free from dust.

Assuming that a few such fixed-out plates have been prepared, let us see how to convert them into isochromatic screens. As already stated, the first object of the screen is to cut out or damp the violet and blue rays, and in order to do this it is necessary to employ a yellow color. Several yellow dyes are at our disposal, some of them more "orange" than others, and as orange is slightly complementary to greens we do not want to use that color except with panchromatic plates (q. v.).

The yellow dyes may be summed up thus:—

Picric acid	}	Light yellow dyes
Naphthol yellow		
Crysophenin		
Auracin	}	Orange dyes
Tartrazin		
Aurantia		

These six will provide us with ample material for experimenting, and for a general isochromatic filter I certainly recommend naphthol yellow, which can be got from most dye manufactures; naphthol yellow S. E. of Bayer's is a fair average sample, and works quite satisfactorily. A solution should be made up as follows: naphthol yellow, 1 part; water, 150 parts. This should

be well shaken up in a bottle several times, and filtered on the day after it is made up, as complete solution does not take place at once. In the filtered solution the fixed-out lantern-plate is immersed, and taken out every ten minutes or so for examination, until it appears of a light lemon-yellow color. A small pocket spectroscope will be found of the greatest use in this work, as the screen may be examined from time to time until all the violet rays are cut out, and the blue rays considerably damped. Without some such means of examination, the making of light-filters is governed necessarily by guess work.

When stained to a lemon color, the screen is rinsed under the tap for a few minutes, and then placed to dry in a rack in as warm and dust-free a room as possible.

It will be found best, or at any rate most interesting, to make about half a dozen filters; one light yellow, one dark yellow, with say, naphthol yellow, tartrazin and aurantia.

(ii) We now come to the method of making a reliable light-filter, which will not cause distortion, and which will at the same time be possessed of higher luminosity, as we shall coat our own glass with perfectly clear untreated gelatine. A few sheets of patent plate, about one-fourteenth of an inch in thickness, should be procured, and thoroughly cleaned on both sides, and then polished with a piece of soft cambric. They are next coated with a warm solution of gelatine made thus: Nelson's No. 1 gelatine, 5 parts; distilled water, 100 parts. (In the absence of Nelson's gelatine, any soft, pure and very transparent variety may be used.)

The gelatine is dissolved with the aid of heat, and the solution is then filtered through three or four thicknesses of fine muslin. A sheet of patent plate, conveniently about 7 x 5 inches in size, is held in the left hand, and a pool of the gelatine solution at about 95° Fahr. poured onto the center of it; the plate is then tilted rapidly from corner to corner until the solution is evenly distributed over the whole surface, and it is at once placed on a leveled sheet of glass or marble to "set"; when quite set, it is placed in a rack to dry,—this will take several hours.

A little practice will soon enable this operation to be performed quite well, so that a very even film of gelatine is applied to the glass. The dry plates are stained in the manner already described, and allowed to dry.

**Mounting
the Filter**

In order to protect the screen from scratches on the gelatine side, it is customary to bind it up with a cover-glass just like a lantern-slide, and if desired, the two may be cemented together by means of a thin solution of Canada balsam dissolved in benzene or xylol.

**Liquid
Filters**

Liquid filters consist of glass cells, with optically plane and parallel sides, into which are put liquids of the desired color. Thus a very weak solution of picric acid or naphthol yellow may be used. The advantage of a liquid filter is that the liquid may be modified or changed at will; but a great disadvantage lies in the double thickness of glass through which the rays must pass.

**Attaching
Filters to
the Lens**

The remaining point to consider in connection with the isochromatic screen is: How is it to be attached to the lens? I must confess that for two or three years I never used anything more than the lid of a pill-box which fitted my lens-hood, the top of which was pierced with a hole about the size of the largest diaphragm, and over which was glued the screen; the screen was of course cut to as near the size of the pill-box lid as possible. A very neat arrangement has been invented by Mr. Sanger Shepherd, an illustration of which is seen in Fig. 8. A brass collar to fit the lens hood is attached to a grooved arrangement into which the (square) screen is slid, it being held in position by springs which are placed in the grooves. A behind-lens shutter is necessary with such arrangements as these, and it is almost a matter of necessity in orthochromatic work, although a circular filter can generally be purchased to fit *inside* the lens hood.



FIG. 8

**Adjustment
of Filters
to Plates**

It is not possible in the space of this monograph to describe the various ways of adapting filters to the various plates, as this adaptation can only be done when adequate instruments are at hand, and thus, although the making of light-filters is instructive, and such filters as above described will produce an extremely marked difference when used with color-sensitive plates, it will be found almost necessary to have recourse to a scientific manufacturer in order to obtain accurately adjusted light-filters. In America properly adjusted filters can be obtained for the Cramer, Seed, Carbutt and Forbes plates. In England, similarly, such filters can be had from most manufacturers of ortho plates or from Sanger Shepherd & Co., London, who specialize in this particular department.

**A Filter for
Copying**

One formula, however. I will give, either for dyeing the screens or for use in a "liquid" cell, which will produce an orange screen suitable for copying pictures, etc., in conjunction with a panchromatic plate: Tartrazin, 7 parts; titan scarlet, 1 part; water, 500 parts. If used as a cell solution, it must of course be diluted until the requisite depth is obtained. It will produce a reddish orange screen which will increase exposure about thirty or forty times that required without a screen.

Exposure

This brings us to the important subject of *exposure*. Fortunately exposure need not be so accurate when using orthochromatic plates and screens, as it is necessarily of longer duration than when photographing in the ordinary way, and the latitude is correspondingly increased.

**Influence of
the Filter**

The increase of exposure necessitated by the use of orthochromatic plates and screens is one of the drawbacks—almost the only one—in their use. It should be clearly understood by now that the violet and blue rays being the most chemically active, the mere fact of our filtering out these rays with the yellow screen deprives us of the most potent part of white light; and, although some makes of plates are very highly sensitized for yellowish green, they still require an abnormal exposure when used in

conjunction with the screen. Consequently, to those who are able to afford it, I offer the advice: Buy as rapid a lens as possible for orthochromatic work, and one which can, if necessary, work at as large an aperture as $F/4.5$ or $F/5.6$. It must not be assumed from these remarks that exposure is so long as to render rapid work of any kind impossible. Snapshot work is quite practicable in summer time, and in winter time too, provided the lens is a brilliant one. The yellow screen of the naphthol yellow type requires an increase in exposure of from four to fifteen times the normal; suppose, then, that on experiment we find one of our yellow screens necessitates giving five times as long exposure as without a screen at all; if the plates used are rapid, i. e., about 200 H. & D. (pyro-soda), one might comfortably give an exposure of, say, a fortieth of a second at $F/16$ on a landscape in summer; hence, when using the $\times 5$ times screen, one would have to give one-eighth of a second, and this exposure is really reasonably rapid.

The reader may pause here and ask whether an orthochromatic plate cannot be used without a screen at all? Color-sensitive plates can certainly be used in *all* instances where ordinary plates are employed, but it is practically impossible to get any advantage unless the screen be employed also. Every colored subject, except under certain (and unusual) conditions of lighting, reflects from its surface ultra-violet and white light, and unless this light is destroyed by means of the colored screen it will suffice to produce the image upon the plate without the colored rays having had any effect whatever, especially in brief exposures.

The professional photographer who has a well-lighted studio and wishes to use orthochromatic plates will find it an advantage to have very pale yellow muslin blinds, so arranged as to cast a distinct yellow light upon the sitter; if he then employ panchromatic plates, no screen will be necessary, and a good orthochromatic negative will be obtained, in which wrinkles and pimples, etc., in the sitter's face will be considerably lessened,—to the saving of a great deal of retouching.

**Landscape
Work**

For landscape work in which yellows and greens are the predominant colors, a good orthochromatic plate of the erythrosin type should be used with a yellow screen requiring between five and fifteen times normal exposure. The $\times 10$ times and $\times 12$ times screens are perhaps the most popular, and will render the blues in a picture much darker, the greens and oranges much lighter, and any clouds in the sky visible and nicely modeled—if I may use the expression. Too dark a screen is apt to give *over-correction*, i.e., the yellows and greens appear almost white, and therefore unnatural.

The exposure through the yellow screen is usually much less when panchromatic plates are used, the added red-sensitiveness being of decided advantage. Carbutt's polychromatic C plate, Lumière's C plate, the "Gem" Tricol plate and Cadett's Spectrum plate are all good examples of panchromatic plates, and ordinary plates bathed with pinacol, homocol or even orthochrom T give excellent total-spectrum sensitive plates. For landscape work with such plates a five or eight times screen may conveniently be employed, but by using an orange screen such as that described on page 384,—necessitating about thirty times the normal exposure,—every color and intermediate hue will be correctly rendered, including the reds. For reproduction and three-color work where red is the dominant color, Cramer's Trichromatic and Seed C Ortho plates are indicated. For general work where the yellows and greens are encountered, Cramer's Isochromatic, Seed's L Ortho and the Orthonon plates will be found equal to all requirements.

**Harshness
of Ortho
Negatives**

It must be borne in mind during exposure that plates of the erythrosin type are generally inclined to be harsh, i.e., their characteristic curve is steeper; also that a little over-exposure is always desirable in any case. A little liberality in exposure, therefore, will, to a large extent, overcome this difficulty, and produce soft and well-gradated negatives.

I do not think it is necessary to discuss the subject of exposure further, as a little experience will show more than a volume of written advice. The next subject,

therefore, to which attention must be drawn, is the treatment of the plates after exposure has been carried out, and we must at once consider the question of the illumination of the dark-room.

Dark-Room Illumination The chemical inactivity of the red and yellow rays led to the adoption of red and yellow light for illuminating the operation of development. It is therefore obvious that when plates are used which have been rendered sensitive to yellow and red, such light is no longer permissible in the dark-room. I have already stated, however, that plates of the erythrosin type are chiefly sensitive to greenish yellow, and practically insensitive to red, and hence for this class of work plenty of pure red light is permissible. If a piece of so-called "ruby" glass be examined with the spectroscope, it will be found as often as not to transmit orange and green light; it is therefore very necessary to use glass that only does transmit red light in order to prevent the occurrence of fog when developing the plates.

A very convenient form of ruby light **A Safe Light** for color-work is the tank lamp. This consists of a gas or oil lantern, fitted in front with a tank containing glass sides which may be filled with a solution of some suitable dye. The mixture which gives the greatest luminosity consistent with safety is made up of: Tartrazin, 5 parts; titan scarlet, 3 parts. A strong solution of the dyes in this proportion may also be used for staining a fixed-out plate, which can then be used in place of the ruby glass. Two thicknesses of double flashed commercial ruby glass is generally quite safe, but it means working in a very dim light. Bayer's red varnish is also a good medium for preparing one's own "safe-light"; it consists of a deep ruby collodion solution, which is distributed over the glass with a brush, or else poured over it in the way already detailed for coating patent plate with gelatine.

Panchromatic plates should be treated with the greatest caution for, being red-sensitive, they are very liable to fog; in fact, it might almost be said that a panchromatic plate which has not a tendency to fog is *not* very

red-sensitive! I prefer in my own work to carry out all operations with panchromatic plates in complete darkness, thus doing away with the risk altogether. The plates, which are usually exposed according to a meter, are developed for four minutes in a metol-hydroquinone solution, which I will give later, and the red light is not turned on until they are safely in the fixing bath. Whenever it is necessary to examine red-sensitive plates during their development, use as little light as possible, and never take them out of the dish to look through them; fog is pretty sure to result if you do.

During the past year or two I have had **Development** many applications for a good developer suited to orthochromatic plates. Now I do not hesitate to say that any developer which will develop an ordinary plate will produce equally good results with a color-sensitive plate. Glycin has been particularly recommended for collodion emulsion plates sensitized with the eosin-silver bath; pyro-soda has been advised for dry orthochromatic plates and pyro-ammonia condemned. As a matter of fact, such distinctions are not at all necessary, and what one particularly wants for orthochromatic work is a formula for a developer that will give a *clean*, brilliant negative with as little bromide as possible.

Perhaps I shall astonish my readers by giving first of all a pyro-ammonia formula, but it has proved itself so excellent with both erythrosin type and panchromatic plates that I feel sure it will be appreciated:

Pyro-Ammonia *A.* Pyrogallol, 2 parts; potassium metabisulphite, 1 part; water, 200 parts.

B. Ammonia (s. g. .880), 1 part; water, 9 parts.

C. Ammonium bromide, 2 parts; water, 19 parts.

For use take 20 minims of *A*, 40 minims of *B* and 30 minims of *C* to each ounce of water.

The excellent metol-hydroquinone formula to which attention has been drawn above, is as follows: Metol, 5 parts; hydroquinone, 16 parts; potassium metabisulphite, 5 parts; sodium sulphite (cryst.), 168 parts; sodium carbonate (cryst.), 224 parts; water, 4,000

parts. When this is used for erythrosin-type plates, two drops of a 10 per cent solution of potassium bromide should be added, whilst for panchromatic plates it is advisable to add as much as four or five drops to the ounce.

If the plates are found in every instance to give too harsh contrasts in the prints, less of the reducing agent must be used, but if a very full exposure be given in the camera, such harshness will be prevented and thus no counteraction be required.

Acid Fixing Bath An acid fixing bath is desirable, and for this the following will be found convenient: Hypo, 6 parts; acetone sulphite, $\frac{1}{4}$ part; water, 40 parts.

Clearing the Plate Should the plates after the acid fixing bath and an hour's washing appear of a yellow tint, due to some dye still remaining in the film, resort can be made to a very weak bath of hydrochloric acid, or to Columbian spirit. As a rule, this trouble will not be experienced, as the dyes added to the emulsion are very soluble in water. Intensification and reduction may be carried out, if necessary, exactly in the way employed with ordinary negatives.

General Precautions In conclusion of this monograph, I will say a few words in connection with the general use of color-sensitive plates, in landscape work and in the photographing of pictures, colored sketches, etc., the former being the branch which appeals more especially to the amateur, the latter to the professional photographer. It will be found a *distinct* advantage to employ color-sensitive plates for all kinds of landscape work, even if no screen be employed, for there are occasions when some advantages will accrue from their use, more particularly when the sun is not shining, and the light is soft, and especially when the sun is low on the horizon. Toward sunset, when the sun is low, the light is of a distinctly yellow hue, and good results have been obtained without the use of a screen. Some makes of plate, moreover, are much more highly sensitized for greenish yellow than others, and these will, of course, be the more valuable when no screen is used.

As regards copying pictures, etc., let me impress upon my reader the great superiority of panchromatic plates over erythrosin-type plates. It is impossible to get correct renderings of the oranges, reds and sepias without a red-sensitive plate, and indeed many of the greens, as well. When half-tone blocks are to be prepared, an enormous lot of re-etching is obviated by the employment of such an emulsion, and the use of a reddish orange screen should be made, even though it increase exposure to forty times normal.

Finally, unless a spectroscopic camera be available for testing bathed plates, it is hardly advisable to experiment with many dyes other than erythrosin and rose Bengal.

T. THORNE BAKER

BOOKS

Isochromatic Photography (Todd's Dime Series No. 5). 1902. Paper, 25 cents.

More about Orthochromatic Photography (THE PHOTO-MINIATURE No. 45). By R. James Wallace. Illustrated. 1902. 25 cents.

The Chemical Effect of the Spectrum. By Dr. J. M. Eder. 1884. 50 cents. Valuable despite its age.

Practical Orthochromatic Photography. Its Scientific Principles and their practical Applications. By Arthur Payne. Pp. 178, illustrated. [English] 1903. 50 cts.

Notes and Comment

Colorprinte is a word we are likely to see and hear very often during the coming summer. It is the name of a new paper for making photographic prints in colors from an ordinary landscape negative—the latest and one of the most interesting attempts at photography in colors thus far introduced.

When Colorprinte was first announced by our newspapers as a Parisian novelty, we smiled at the apparently absurd claims made for it—*vide* THE PHOTO-MINIATURE No. 66, page 367. But fact is stranger than fiction. Two or three weeks ago we had an opportunity to give practical trial to the paper, and it actually fulfilled the claims of the manufacturers—giving prints in colors approximating the tints of nature from an ordinary landscape negative.

In appearance Colorprinte consists of ordinary pigment paper. It is sensitized by immersion for three minutes in a two and one-half per cent bichromate bath; squeegeed to a ferrotype plate and dried. Printing is done in the usual way, but, as the image is not visible on the black pigment surface, a small strip of gelatine-chloride paper, at one edge of the negative, is used to judge when the exposure to light has been sufficient. When the print on the gelatine paper reaches "proof" depth, the pigmented paper is placed in a tray of cold water, allowed to soak for a few moments, and then transferred to a piece of transfer paper (supplied with the Colorprinte), as is usual in carbon printing. The two papers adhering face to face are now squeegeed into close contact and left for a few minutes, and then are placed together in a tray of warm water—about ninety-five degrees. In a few minutes the original Colorprinte paper can be gently removed from the transfer support, leaving the pigmented tissue adhering, as a mass of dark

red color, to the transfer paper. This is now turned face down in the warm water and development proceeds, usually taking from five to seven minutes to complete. When the colors are seen to be clear and bright, as in the original subject, development is complete and the print is immersed in cold water or a weak alum solution to arrest further development and then is hung up to dry.

By this brief description it will be noted that the Colorprint is similar to the familiar carbon process; but in actual operation it is much simpler, no manipulation or local treatment in development being necessary or desirable. Good, ordinary "contrasty" negatives give the best prints as a matter of course, but a successful print is the natural result of any negative which correctly represents by its densities the luminosity contrasts of the subject.

All this may read like a fairy tale, but it is very simply accomplished by coating paper with several successive layers of pigments of colors, in the order of the usual relative densities of those colors on the average landscape negative—the invention of an Austrian army officer Dr. von Slavick, perfected by Dr. Adolf Hesekei. Colorprint is being introduced in this country by Howe & Hall, 84 Wabash avenue, Chicago. We understand that the first supplies for Colorprint will be ready about May 1, and that a 4 x 5 equipment can be had for a dollar. Those who can enjoy a few hours of interesting experiment should send along their dollar and try Colorprint. It is quite possible that they may fail to get a good print out of the first dozen pieces, and it is equally probable that they will get two or three prints out of the dozen for which they would not accept five dollars. This last was our own experience with Colorprint. Whether the reader succeeds or fails in his first attempts with Colorprint, it is certain that he will get his money's worth in the interesting possibilities exhibited by Colorprint during his experience with it.



The new catalogue of the Folmer & Schwing Mfg. Co., New York, is as interesting in its information as

it is convenient and dainty in its make-up. It includes detailed descriptions of the Graflex and Graphic cameras with the new Auto Graflex, the Graphic Naturalist's Camera, the Stereoscopic, Telescopic, Twin Lens and Deceptive Angle Graflex. The Sky Scraper Camera is an instrument of the field form, with a practically square bellows and unusual facilities in the way of rising front and double swing-back, designed for the photographing of tall buildings. The Graphic Focal Plane Shutter, Folmer X-Ray Table and the Folmer X-Ray Reflecting Stereoscope are also described at length, together with many other valuable accessories manufactured by this enterprising firm. Readers of THE PHOTO-MINIATURE engaged in serious work should give this catalogue careful study in anticipation of the photographic season just beginning.



The announcement of the lectures arranged by the Photographical Section of the American Institute, New York, embraces a remarkable variety in subjects and interest. We are pleased to note the vitality and enterprise of this oldest of American photographic societies, which was organized in 1859, with Dr. John W. Draper as its first president. The present officers of the Section are Oscar G. Mason, president; Robert A. B. Dayton, vice-president; James Y. Watkins, treasurer, and John W. Bartlett, M.D., secretary.



The Gray-Lloyd Mfg. Co., Ridgewood, N. J., has recently introduced a Wide-angle Stigmat, the peculiar feature of which is that it embraces an angle of ninety degrees and covers the entire field sharply at its largest aperture of $f/6.8$. In this capacity and its defining power, the Gray Wide-angle Stigmat marks a decided improvement over other wide-angle lenses. The series embraces focal lengths of 6, 6.8, 8.8, and 11.6 inches. The front element of the lens is composed of two cemented pairs of lenses, the outer one of which may be slightly unscrewed to increase softness, without disturbing the other parts of the objective. The posterior

element is composed of two cemented lenses. Either element may be used alone, their foci being in the proportion of 14 and 11 inches and 7 inches for the combined lens.



Mr. E. J. Davison, commercial photographer, of Kansas City, advises us of his removal to the Indiana Building, Southeast Corner Twelfth street, Grand Avenue. Among the commercial photographers within our acquaintance, Mr. Davison is unequaled in his skill and capacity for successfully carrying through the most difficult kinds of commercial work. He is a specialist in the widest sense of the word, and has built up an enviable business and reputation by his flashlight interiors, photographs of large manufacturing plants, panoramic landscapes and animal photography. We wish him that continually increasing success which his energy and work so well deserve.



The Cape Astronomical Observatory in South Africa has recently secured from Taylor, Taylor & Hobson, Ltd., of Leicester, England, and New York, what is probably one of the largest photographic lenses yet made. The smaller Cooke lenses are well known in America, but this giant among lenses has an aperture of about 10 inches in diameter, the weight of the glasses alone being 100 pounds, and the total weight of the lens, with its mounting and camera, being over 6,000 pounds. This Titanic Cooke Lens forms microscopically sharp images of the stars throughout a negative 15 inches square, the exposure for each plate being about two hours. The successful manufacture of this remarkable objective is another triumph for the makers of Cooke lenses, of which they may well be proud.



The Rochester Panoramic Camera Company send us an interesting booklet describing the Cirkut Camera, which they are about to put on the market. This instrument is a revolving camera, containing a relatively

stationary lens and a relatively moving film, the latter moving past a vertical slot through which the exposure is made, the axis of the camera being at any desired point between the lens and the film. This form of construction is said to possess definite advantages over other forms of panoramic cameras in which the swinging lens and stationary film are arranged in semi-circular form, limiting the angle of view to less than 180 degrees and oftentimes producing negatives showing pronounced distortion. With a Cirkut Camera 9 x 12 x 12 inches in size, the photographer can make, with one exposure, a negative 12½ feet long by 10 inches high, completing a circle of view equally sharp from end to end. Those who can make an opening for panoramic work should certainly not overlook the Cirkut Camera.



A folder offering much practical information on diaphragms, shutter speeds, focal plane shutters, lenses, pinhole exposures, and the Wynne Meter, comes to us from Mr. Henry Wenzel, Jr., 237b South Fourth Street, Brooklyn, N. Y. A copy of this folder can be had by sending a stamped envelope and request to Mr. Wenzel. Every hand-camerist should possess it.



Mr. J. H. Thurston, 50 Bromfield street, Boston, Mass., sends us an announcement concerning the Boston Camera Club. This society offers the amateur photographers of Boston and vicinity all the advantages of an up-to-date club equipment, including a studio with skylight, backgrounds, camera and Dallmeyer Lenses for portrait work, several dark-rooms fitted with every convenience, an electric enlarging apparatus, printing-rooms for sunlight or artificial light printing, private lockers for the storage of chemicals, the usual social features and exhibitions, and a well-equipped library. Club meetings are held each month, and those who can avail themselves of the facilities of the Club are cordially invited to communicate with Mr. Thurston.

The Tacoma, Washington, branch of the Gailey Supply Company, has been purchased by the Tacoma Dental and Photo Supply Company. The personnel of the new company consists of Mr. Paul T. Shaw, local manager of the Gailey Supply Company for some years past, Mr. H. J. Fries and Mr. E. F. Benson. These gentlemen are all well known in Tacoma and vicinity, and the new business should prosper under their care. Tacoma is the natural supply center for southwest and middle Washington, as well as for the northern part of the state, and the Tacoma Dental and Photo Supply Company are perfecting plans for a prompt and complete service for amateurs and professionals within the confines of its field.



A very complete catalogue of optical and enlarging lanterns and accessories comes to us from Messrs. Burke & James, Chicago and New York. This list shows the newest models in the lantern field, and includes many labor-saving devices, making for greater efficiency in lantern work and enlarging. We hope that the facilities offered by Messrs. Burke & James will result in a larger popularization of the lantern for entertainment and educational work.

Among the novelties for photographers introduced by this house, we note no less than five different models of spirit-levels for cameras, and the Ingento Roller Blind Shutter with a new device for setting the shutter by means of a metal key, instead of the usual string; also, a camera bed-brace for view outfits which is easily attached to the camera and makes it absolutely rigid, with the back and front perfectly upright and parallel.



Among the few grand prizes awarded at the St. Louis Fair, one fell to the exhibit of the C. P. Goerz Optical Works for their display of photographic lenses. This recognition of the excellence of the Goerz objectives was well merited and should still further establish them in the affections of American photographers.

The Edinburgh (Scotland) Photographic Society is busy with a photographic survey of Edinburgh, Leith and vicinity, embracing photographs, drawings, etc., of the streets, buildings and monuments of Edinburgh, as they now exist or have existed in the past, with representations of the civic and social life and customs of the city. This survey work is an enterprise of the most meritorious sort, and should commend itself to photographic societies in all our larger cities or districts possessing historical landmarks. It is especially applicable to American photographic societies located in towns which are changing by reason of their growth. We hope that the American Federation of Photographic Societies may be induced to take this up actively, for the benefit of those who come after us.



Until within the last few months the American photographer has been dependent upon foreign manufacturers for his carbon paper and other supplies needed in the process of carbon printing. We note with pleasure that the Rotograph Company, 771 East 164th street, New York, has taken up the manufacture of carbon paper and has ready a very large variety of tissues in several colors. Readers desiring to make the acquaintance of this most beautiful of all printing processes should write to the Rotograph Company for particulars of its carbon paper.



Among the peculiarities of American photographic advertisers, that most marked is their insistence that the readers of magazines wherein they advertise should not only buy the products announced by the advertiser in the magazine, but should also put themselves into direct communication with the advertiser. In other words, the American advertiser is not content with selling goods by means of his advertising, but seems to require a personal communication from those who are led to use his goods through his advertisements. To induce this direct communication, the average advertiser prepares a variety of interesting printed matter, which the reader is asked

to send for. Among the advertisers most eager for this personal relationship, Mr. Henry Wenzel, Jr., 237b South Fourth street, Brooklyn N. Y., is preëminent. Readers of *THE PHOTO-MINIATURE* who are at all interested in the question of exposure and negative-making can secure a little bundle of interesting information, and "boost" Mr. Wenzel's personal opinion of *THE PHOTO-MINIATURE*, by sending a stamped and addressed envelope to the address above given, asking for the Wynne booklet. We are sufficiently desirous of helping in this good work to offer to supply the curious with stamped and addressed envelopes for this purpose on application.



The most complete survey of photographic backgrounds for all sorts of portraiture is that given in the last number of the *Photo Ticker*, which may be obtained on request from W. P. Buchanan, 1226 Arch street, Philadelphia, Pa.



The only American worker awarded a medal at the last exhibition of the Royal Photographic Society (London) was Mr. Henry Havelock Pierce, of Providence, Newport, Boston and elsewhere. Mr. Pierce has for some time past made a specialty of home portraiture, and we have more than once keenly enjoyed a glimpse through his portfolios. We know of no other professional photographer who has achieved such remarkable results in this difficult branch of work as Mr. Pierce, for which reason we rejoice in his success abroad.



THE UNOFOCAL LENS.—Writing of the new Unofocal Lens, invented by Steinheil, of Munich, Mr. George Ewing says: "This anastigmat has some novel optical properties. It consists of four lenses, two of which are positive, and two negative, and the amazing feature of these component lenses is that they have all the same focal length, and, moreover, are all made from glass with the same mean refractive index. Such a construc-

tion would suggest that an exact neutralization was produced by the two positive against the two negative component lenses, but the power is obtained by placing the lenses at slight distances apart. It is well known that, whereas a convex lens of one-inch focus will exactly neutralize a concave lens of the same focal length when they are placed in contact, it will no longer do so when the lenses are separated. For the same reason two glasses with different dispersion, but the same mean refraction, may be made use of to correct the chromatic aberration. It may be here explained that in order to make an anastigmat lens, a certain condition, called the Petzval condition, has to be satisfied. This condition demands that the foci of the component positive, or convex lenses, of an anastigmat lens must bear a particular ratio to that of the component negative, or concave lenses, and this ratio has to be that of the refractive indices of the glasses out of which the lenses are made.

“Now the utmost possible differences in this respect between the glasses which are available is very small, about 15 to 16, so that the positive and negative lenses have to be very nearly the same in focus. Consequently they have to be individually very high in power, deep concave lenses balanced against deep thick convex lenses, and the result is a balancing of great errors of a positive nature against equally great negative errors. In order to properly make all the corrections in a photographic lens when hampered by such a serious limitation is very great, and Dr. Steinheil's new invention of making all the foci and the refractive index of all the component lenses the same, removes this difficulty, and allows the choice of the foci and the shapes of the lenses to be determined in such a way as to correct all other errors. The Petzval condition having been, as it were, automatically complied with, long-focus low-power lenses may be employed which allow of flat curves, which produce scarcely any loss of light from reflection, and consequently an increase of the relative rapidity. The Unofocal lens is entirely free from flare, and an $f/4.5$ lens, when stopped down, is as good as any other for wide-angle work. The central definition is so perfect

that it is also unusually suitable for telephoto work and projection purposes." The Unofocal is made in two series, one with an aperture of $f/4.5$ and the other $f/6$, and is introduced in America by the Fidelity International Agency, 621 Broadway, New York.



PRINTING ON RICE PAPER.—We have received from an Ohio subscriber a few prints on Japanese rice paper, presenting the extremely novel effect of photographs on velvet. As many of our readers are aware, the papers coming to us from China and Japan offer a wide field for experimenting for the obtaining of distinctive effects in photographic printing. The soft, lustrous depth and sheen of these prints on rice paper would seem to be peculiarly appropriate for the proper rendering of certain textures. For the information of those interested in experiments of this sort, we transcribe part of the letter received with the prints: "Japanese rice paper is very difficult to obtain in this country, but can doubtless be readily secured by those who have friends living in San Francisco or in the East. This paper is cut from the pith of a plant, the width of the sheet depending on the size of the stalk. It is exceedingly delicate to handle, and calls for the most careful manipulation in sensitizing, developing, etc. The prints sent herewith were obtained by spreading or coating the paper with Newcomb's Blue Print mixture or a home-made platinum sensitizer. In sensitizing, one must go over the surface of the paper quickly and lightly, as it immediately becomes pulpy with the least moisture. After sensitizing, the little sheets are hung up to dry in a warm, dark closet, being fixed with a pin or fine needle through one corner (a clip would tear it). It dries in about ten minutes, but will be very much warped and quite brittle, so that in placing it in the printing-frame the greatest care must be taken. In examining the exposure of the print in the printing-frame, care must be taken not to break the prints across the hinge of the frame. In development, proceed as with any platinum paper, lifting the tender print from one tray to another by slipping a piece of glass under it. In washing the

prints they must be completely immersed in several changes of water, without allowing the water to run in a stream upon the paper, which would cause it to tear. Drying and mounting offer still more difficulty. On no account must the paper be thoroughly dry before mounting, as when dry it will warp and is exceedingly brittle, breaking at the slightest effort to spread it flat. If placed between sheets of blotting paper while wet, and put under tolerably heavy pressure for about half an hour, it will usually be sufficiently dry to apply a thin paste to the back of the print. It is then taken up by two corners, and gently laid down upon its mount in correct position. If there are wrinkles, do not try to work them out by pressure with the fingers; the paper has a pile like velvet, which is removed by the pressure of the fingers. Lift the corners of the print until the wrinkles disappear, and then allow the print to fall back gently into place. Put it between blotting papers under weight as before, and leave it there until quite dry on its mount." The surface quality and texture of these prints must be seen in order to be fully appreciated.



A CURIOUS EXPERIENCE.—Mr. F. H. Thompson, of Portland, Me., relates the following curious experience and sends us a print from the negative "to prove it."

"Some few weeks ago I attempted to make a photograph of a large thistle. Just as I was ready for the exposure a butterfly perched himself on one of the blossoms. I made the exposure, went into my dark-room and developed the plate. Finding that it was slightly over-exposed, I went back to the thistle and made a second exposure, but, forgetting that the plate-holder had an empty slide, carelessly used that side of the holder and did not discover my mistake until, going into my dark-room again, I vainly attempted to develop the image upon the plate in the other side of the holder, which, of course, had not received any exposure. By this time the unexposed plate had had considerable soaking in the developer. Draining off the surplus developer, I

placed the plate on edge on a blotter for a few seconds, and then returned it to the plate-holder, still wet. Going back to the thistle, I made a normal exposure on this wet plate, returned to my dark-room; and to my surprise, upon drawing the slide from the holder, the subject was seen to be almost fully developed upon the wet plate. I thereupon placed the plate in the developer for a few seconds only, fixing and clearing in the usual way, and so obtained a very good negative. Later I repeated the experiment, and got the same results." The print sent by Mr. Thompson is a very good photograph of a thistle, from a plate apparently a little over-exposed.



THE PHOTO-MINIATURE No. 68, dealing with an entirely new side of photography, viz: Photography in Decoration, will be ready for delivery at the end of the month. This monograph has been written and illustrated by Mr. J. Horace McFarland, the uses of the photograph in decoration having been his hobby for some years past. His account of these uses, and his practical suggestions, will, we believe, make one of the most interesting of the little books in this series.

With regard to future issues of THE PHOTO-MINIATURE, we gladly advise our readers that the many difficulties which have kept us back in the past are gradually clearing away, and we have substantial hopes of publishing two issues per month until the magazine is once more on time—a consummation devoutly desired by ourselves as well as our long-suffering readers.

The American Salon

This international exhibition, which was held at the Clausen Galleries, Fifth Avenue, New York, during December, and which is now on a tour of the principal cities of the United States, proved an overwhelming success for its organizers, Mr. Curtis Bell and his associates of the Metropolitan Camera Club and the Federation of American Photographic Societies. In this issue will be found reproductions of a few of the pictures shown at the Salon, from which our readers may judge for themselves of the quality of the exhibition.

In response to the invitations sent out to photographers at home and abroad, it is said that there were submitted no less than 9,000 prints, including about 1,500 pictures sent by foreign exhibitors. The jury comprised twenty painters of national reputation, including Kenyon Cox, Childe Hassam, W. M. Chase, Edwin H. Blashfield, Will H. Low, John W. Alexander and John La Farge. This jury gave three sittings to the judging of prints submitted, with the result that about 300 pictures were given place on the walls of the Clausen Gallery. These 300 prints comprised almost every variety of photographic work bearing evidence of pictorial intent. Naturally, landscapes were in the majority, and many attractive examples were shown in this class. Portraiture was not adequately represented, but the few examples shown were good. Marines, genres and interior work were well represented, and these classes included some very strong work. A notable feature of the exhibition was the acceptance of a very large number of examples of what is commonly known as "straight photography." The great majority of the prints hung were platinotypes or toned bromides, with a few carbons, and here and there a gum print. Highly colored prints, regardless of the

process by which they were produced, were comparatively rare, this being due, we understand, to a certain prejudice against color in the minds of the painter-jurors.

Necessarily, with such an enormous number of would-be exhibitors, many prints worthy of acceptance were rejected by the jurors, simply for lack of wall space. It was generally conceded that the Clausen Galleries were too small for the purpose, and, consequently, the exhibits were somewhat crowded for effective viewing. This will doubtless be remedied next year by the choice of more spacious galleries, or by cutting down the number of pictures to be accepted. It is impossible, without running to greater length than these notes allow, to give any detailed account of individual pictures; but as the Salon is to be shown in many of our principal cities during the year, most of our readers will have an opportunity to see the exhibition for themselves. We heartily congratulate those responsible for the American Salon on the success of their undertaking. The exhibition proved beyond peradventure that there is a very large class of amateurs in this country bent upon serious work with the camera. It cannot be doubted but that the exhibition will materially advance the public interest in the possibilities of photography, and encourage those who aspire to the realization of these possibilities.

Postscript to No. 66 The Photo-Miniature

Editor: *The Photo-Miniature*—

Dear Sir:—The writer of your No. 66 takes, in his treatment, the following procedure:

(1) An exposé of the Time and Temperature Method of development, under the Hurter and Driffeld System. This he accepts as carrying with it a scientific completeness.

(2) A statement of the Watkins Method of the first appearance. This, he tells us, does not accord with the Hurter and Driffeld System.

(3) He quotes in part from me, on Development by Inspection, and which he needlessly restricts to the Tentative Method.

Speaking of this (3) method, that writer says: "Whatever its virtues and conveniences . . . there can be no doubt that it is based upon an imperfect understanding of the functions of exposure and development." And again, "The fallacies of these earlier systems and their lack of rational basis is clearly demonstrated by the researches of Messrs. Hurter and Driffeld."

I trust that it will not seem immodest in me to here state that for years I have interested myself in scientific pursuits, and that any "imperfect understanding of functions," or any basis which is not "rational," is particularly distasteful to my habits of thought. Therefore, I feel some competency in defending a system of development which, after a careful examination, I approve. Especially do I feel adequate to point out the limitations of the system which that writer so unqualifiedly commends. Let me not be understood as wholly condemning the Hurter and Driffeld System. On the

contrary, I think THE PHOTO-MINIATURE No. 56 to be among the most interesting and instructive of the series. In a critical sense, it would have been more satisfactory had the original data, and the full mathematical interpretation of this data, have been given. Nevertheless, I am willing to accept all of its *legitimate* results. My criticism is not that it is not scientific, for I believe that it is so. My criticism is, that it is inclusively scientific, but not conclusively scientific. It is scientific *within* the limits it has set for itself, but does not cover the limits *beyond* its experiences. Its error is in its presuming to overstep its limits. Within its limits it is plain, that "development cannot be made to usurp the function of exposure," but beyond its limits, this does by no means follow. Indeed as a fact, we know that, by a "modification" of the developer, very extreme aberrations in exposure can be taken care of. In his system Mr. Driffield found a variation of 1 to 10 to be extreme. In an early number of this magazine a reputable writer tells of an expert who, under test, got undistinguishable prints by modifying the developer, in exposures varying from 1 to 250. On page 359 (No. 66) I stated that by tests I pushed this to 1 to 800. Doubtless hundreds of others could furnish similar tests. Now what is the writer of No. 66 going to do with these facts? If he denies them, practical men will simply put him out of court. If he accepts them, the same practical men will tell him that it is utterly impossible with developers not modified. If, then, the Hurter and Driffield System is true, and if the above are facts, how, it may be asked, is the paradox to be solved? This burden is on the other side, but I think it an easy one. A cold developer with plenty of bromide must, as the practical men tell us, actually cut off or annul a portion of the exposure, so that only that amount of light action is chemically effected in the development, which will produce the tangent line of correct exposure (Hurter and Driffield System) where the arithmetic ratio of density corresponds with the geometric ratio of exposure.

Thus it seems to me, that, however interesting the Hurter and Driffield system is from a theoretical stand-

point, it really is of little utility to the merely practical man. I also wish to say—which I regret to see was suppressed in my article—that the Watkins system is defective, from the fact that it regards development throughout, as represented by a right line, when, as a matter of fact, all initial dynamics of nature can be represented only by curves. If the reader will note the under-exposure of the Hurter and Driffield system characteristic curve, he will clearly see the force of this criticism. Your correspondent, Mr. Little, on page 363, places his finger on the right spot when he speaks of the difficulties in the Watkins system in under- and over-exposures.

I cannot now do better than reiterate what I formerly said: In any art, the sooner we learn to depend upon our physical senses and a discriminating judgment for each particular detail which comes before us, the sooner will we acquire a real skill in that art. A slavish dependence upon hard-and-fast rules and machine-methods will only end by making us indifferent artisans, to say nothing of artists.

In conclusion, I would suggest that we should all be careful not to allow partial theories—sound as they may be within their limits—to too much dominate our judgments. It has almost always been, that the art precedes its science, and the more carefully and profoundly we examine the continuous practice of the art, the more we will usually see that the practical men—it may be ever so roughly—are by a kind, gravitating instinct, working near the correct principles, as would be unfolded by a comprehensive science. If this was not true, the mass of mankind would lose their worth and dignity.

Yours truly,

GASTON M. ALVES.

To this letter, as editor of the monograph in No. 66, I make brief reply as follows: That life is short, and it were better to give practical trial to the methods of development explained in No. 66 than to enter upon an interminable discussion of the theoretical aspects of them. I hold no brief for the Hurter and Driffield System, nor for the Watkins Method; neither have I any

prejudice concerning the method of "Development by Inspection" preferred by Mr. Alves, on grounds apparently satisfactory to himself. Nevertheless, after a lifetime spent in photography and considerable experience with the three methods given in No. 66, I believe that the Hurter and Driffield System offers the most rational basis for the solution of the great problem: *How to get a good negative every time.*

The plain purpose of THE PHOTO-MINIATURE No. 66 was to present, side by side and as simply as possible, three practical methods of development as a step toward the solution of the aforesaid problem—for the inexperienced worker. Choice as to the method to be employed in practice was, of course, left to the individual reader. Clearly, in such a matter, every man is entitled to his own opinion as to the method which will best help him to attain his end. If the reader, after comparative trials of the three methods, does not agree with my opinion: (1) that the earlier methods of development were based on an imperfect understanding of the functions of exposure and development; or (2) that their fallacies and lack of rational basis are demonstrated by the investigations of Messrs. Hurter and Driffield, why—let him hold fast to his own opinion, at least until he is sure that he fully grasps the Hurter and Driffield System and its practical application in negative-making. There is no assumption of infallibility on the part of THE PHOTO-MINIATURE. Its pages clearly show a continual seeking after truth, with a decided leaning to the short cut.

What Mr. Alves says in the paragraphs numbered 1, 2, 3 in his letter and, later, about the Hurter and Driffield System in general, expresses his opinion of these things, but does not affect their truth or untruth. Thus: (1) It is nowhere claimed that the Hurter and Driffield System "carries with it a scientific completeness." On the other hand, the investigations of Hurter and Driffield are obviously put forward as a basis for further investigation; as a method of learning something about the plates we use and the problems involved in exposure and development as factors in the truthful representation of natural objects as far as light

and shade are concerned. Necessarily, where definite experiments are described, the conclusions which follow are stated. I may mention here that the Hurter and Driffield System, and the conclusions reached by Messrs. Hurter and Driffield, are accepted and used by many of the leading dry-plate manufacturers in America and Great Britain. For a rigidly scientific confirmation of their findings, the interested reader is referred to the papers of Messrs. Mees and Sheppard in the *Journal* of the Royal Photographic Society (London) for July and November, 1904. A glance over these papers will abundantly explain, also, why Mr. Vero C. Driffield gave, in THE PHOTO-MINIATURE No. 56, a simple abridgment of the Hurter and Driffield investigations, rather than "the original data and the full mathematical interpretation of this data," as desired by Mr. Alves. (2) It is obvious that the Watkins Method of determining the duration of development by the "time of appearance" of the image is not wholly in accordance with the Hurter and Driffield System—on which point see page 386 of THE PHOTO-MINIATURE No. 56. The "suppression" of Mr. Alves' opinion of the Watkins Method is very simply explained. The first part of his manuscript criticized in general terms both the Hurter and Driffield System and the Watkins Method. In THE PHOTO-MINIATURE No. 66 I was not concerned with criticism, but wholly with a plain and practical exposition of the three systems. The second part of Mr. Alves' manuscript gave a clear explanation of the tentative method of development, and thus came within the scope of the monograph. Part I was therefore omitted and Part II published—without any idea of "suppressing" anything of value to the reader. (3) I am unable to distinguish between "Development by Inspection" and the "Tentative Method of Development" as commonly understood. The cardinal principle of tentative development is the possibility of modifying the developer or method of development according to the requirements of the plate as ascertained by inspection during development.

JOHN A. TENNANT.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

NOVEMBER, 1904

Number 68

Decorative Photography

The art, or practice, of conventional decoration has had many vicissitudes, especially in America. This land, quick to respond to all influences that seem new, whether desirable or not, and with its population made up in some part from every land of all the earth, has had its crazes or vogues of decoration. Sometimes these vogues have pervaded everything from dress to architecture, and while the former has reacted immediately from an enormity, there yet remain to be seen mournful examples of "Eastlake" effect in grotesque houses. The recoil from the "Queen Anne" type is fully within remembrance, as well, and these ornate and specialized architectural forms, with many others I need not name, have always had a strikingly distinct effect on decorative procedure. Wall-papers, picture-hanging, linen, book-covers, car interiors and all the familiar surroundings of our daily life take form from the prevailing decorative thought, whether it be true or false.

It is possibly apropos to say that these words are written in a Pullman sleeping-car, the second one in which I have found a shelf to attempt rest upon in three days. The other one, in the Canadian service, was of the vintage of 1890, and full of nameless but not formless horrors of wooden, woollen and mosaic ornamentation, calculated to banish rest in the daytime and to induce nightmare when sleep was attempted. The one in which I write shows a vast improvement in line, form and color, and it is not too much to ex-

pect that eventually the feeling for true simplicity will reach the builders of Pullman cars so that they will set real comfort for the eye before garish display.

It is undoubtedly to the words and works of Ruskin and of Morris that this modern tendency to settle down into forms of simplicity and true beauty is due. The one taught the principles; the other, by cunning and strong handiwork, introduced the practice.

Decorative Photography Overlooked With these conditions existing, it is perhaps as well that the possibilities of photography as a purely decorative agency, apart from relation to pictorial work, have been overlooked. That they have not been largely used is certain; and it is just as certain that, as the wonderful process of photography comes into play, it will become the most facile and familiar tool of the decorative worker.

The subject of decorative photography is so broad, and so new, that its adequate treatment is certainly beyond not only my present opportunity but my ability. I can, therefore, but hint, as efficiently as I am able, at the fascinating lines which open before the consideration of photography as a decorative agent, while hoping that there will follow, as the practices of the art may develop, a more efficient treatment of it.

Before taking up the detail of the work, it will be best to consider briefly the field. What is the field of decorative photography, I ask? I may properly answer, Every truly decorative surrounding of modern life! This includes, inevitably, nearly all the surroundings of that life, for the time is long past when bare utility is the only end and aim. We no longer rest satisfied that the things we deal with are useful and strong, or ingenious and comprehensive, or sanitary and comfortable. They must be beautiful, as well; and in this insistence we but hark to ages of antiquity and learn again the oft-taught lessons set forth to us by history and by mythology.

Modern decorative art deals with all materials, used in all places; and for much of the work of designing, photography may be made useful. Let us glance over a

few of the fields in which it offers facility, but for a moment let us first mention a few technical essentials.

**Technical
Essentials**

While the inexperienced amateur can do something in decorative work, it is obviously better that one who aspires to produce unique or pleasing decorative results in photography should have a fair acquaintance with the camera and its handling. The ability to make photographs of the natural size of certain objects, sharply defined, with a well-chosen background, is essential to success in this field.

For the most part, the same methods and apparatus are desirable as were suggested in *THE PHOTO-MINIATURE* No. 13, *Photographing Flowers and Trees*. A camera with plenty of bellows extension, so that objects may be easily photographed full size, is important, and it should be fitted with a lens of moderately short focus—as, for instance, a seven-inch lens for a 5 x 7 camera—in order that objects may be conveniently focused in natural size. A camera-stand for maintaining the camera in a vertical relation to a horizontally placed plate-glass exposing platform is nearly essential to this work, and if that stand is portable, and with its parts adjustable at various angles from the vertical, so much the better. A collection of sheets of cardboard of various colors from black to white, to use as backgrounds, is necessary, for in this work control of the background is essential to proper results.

**The Handling
of Flowers**

As many of the subjects that the present writer, at least, has to suggest for decorative treatment are flowers, leaves, fruits, etc.—parts of the growing plant or tree—some acquaintance with prompt and successful handling of these objects will be helpful. It is, indeed, to an appreciation of the almost untouched wealth of motive and potential design in these natural objects that the writing of this monograph is due. The suggestions here made, and applied in a limited practice to flowers, ferns, fruits and the like, may also be applied to other objects—a design worked out with wire nails may be as pleasing for a certain use as one taking its motive from a violet may be for another use.

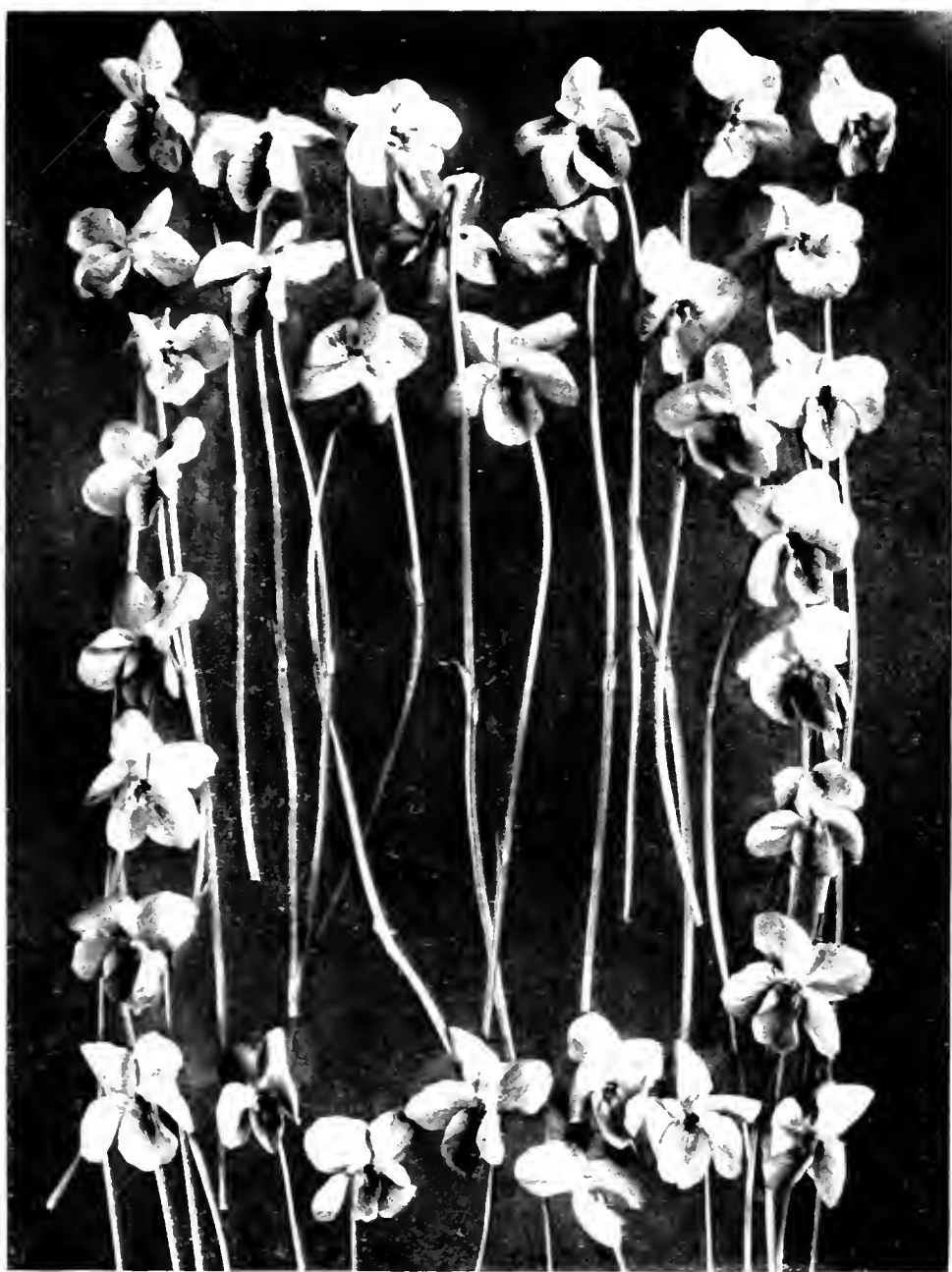
The before-cited PHOTO-MINIATURE No. 13 will assist the worker who is desirous of pursuing this subject in the matters of technique and of apparatus, and will guide him past some of the difficulties that might otherwise discourage him.

**The Place
to Work**

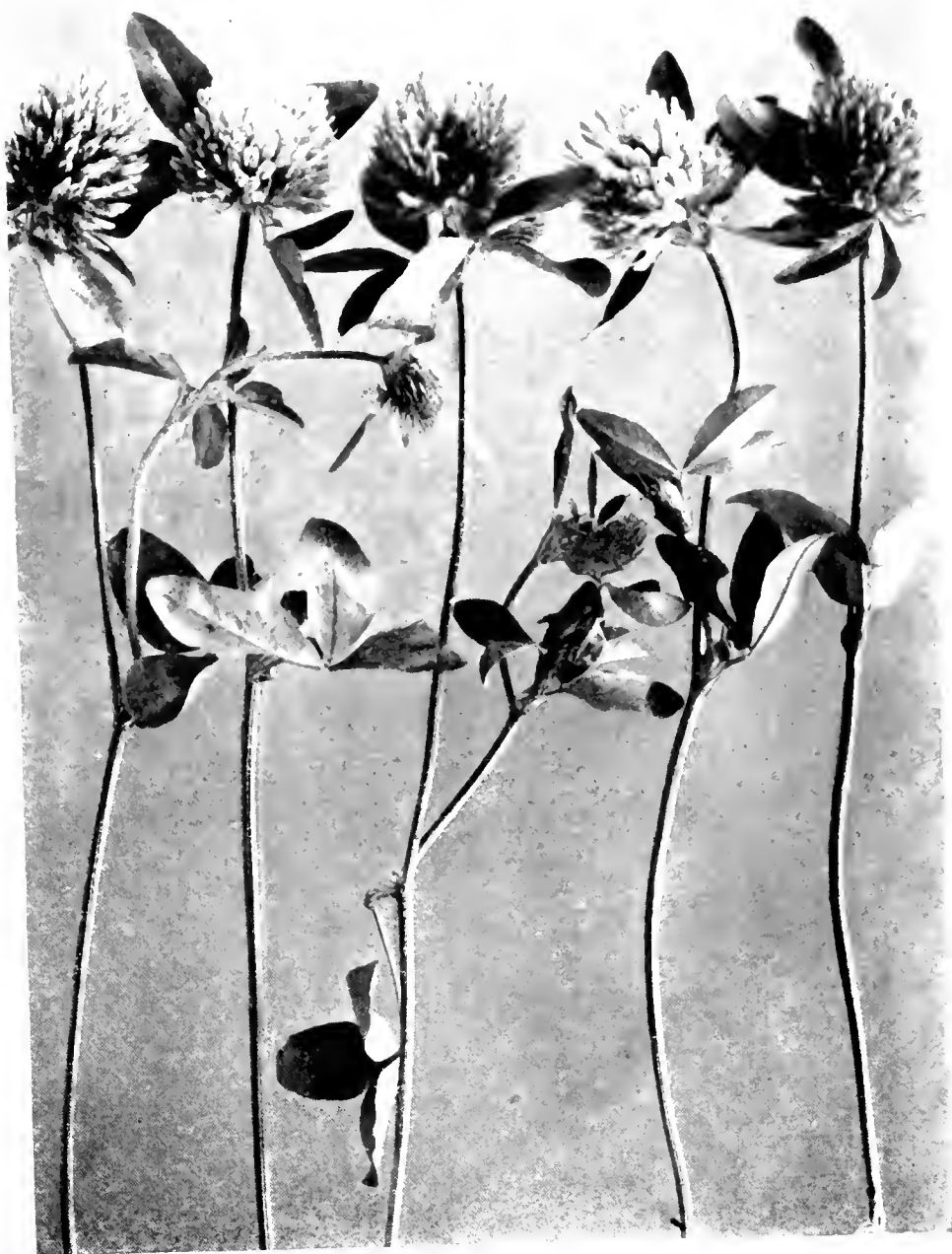
In passing from the questions of apparatus, special methods and desirable previous experience, it may be in place to say that while this work of decorative photographic design composition may be pursued anywhere that light conditions will permit, a cool, well-lighted north room, with, if possible, light from either east or west to supplement and qualify the north light, will be most serviceable. In a cool room, leaves and flowers will longer retain their freshness. I have seen the very best efforts fail in a city top-floor skylight studio, with a summer temperature requiring three figures of Fahrenheit's scale to express! Indeed, it is only telling the bare truth to say that the elusive, delusive, fascinating and expensive "three-color" process, as used commercially, would be far more practicable for natural objects than for anything else, if the regulation studio where the *ignis fatuus* is pursued was not, almost invariably, a combination of the temperature of a furnace with the fumes of a chemical factory. Once upon a time, with everything of skill, experience and apparatus otherwise favorable, I saw carnations of full freshness fairly melt in the fearful atmosphere of heat and collodion fumes before they could even be focused upon.

As a contrast, I remember one July day, with an average temperature of 98° in the shade, on which I successfully photographed, in full size, the very delicate flowers of the Japanese iris; but I worked in a cellar, just under the open doors, the difference of nearly twenty degrees in temperature meaning life for the flowers, comfort for the worker, and results worth while.

But preliminaries of photographic technique hinted at, let us take up a concrete subject. Nothing, it seems to me, presents a better opportunity for photographic design than a book cover. Under modern publishing conditions, few books, save those for technical or



Many of the smaller flowers fall happily into attractive designs for book covers, etc.
See page 427



Even clover-heads, skilfully arranged, offer pictorial possibilities for book covers.
See page 427

school use, have plain covers. Design is the rule, and not the exception. Consider, then, the applicability of the thousand and one natural ideas for book-covers; note how well the oak-leaf, the acorn, the violet, the pansy, the dandelion, the maple-seed, or "samara," the cherry, the chestnut and an almost infinite extension of these familiar objects will adapt themselves to a relatively conventional treatment for design.

A decision should be made at the beginning of the designing effort as to whether the attempt will be to use the branch, twig or cluster as a whole, or to take the flowers, pods, acorns, or whatever the motive be, for separate conventionalizing. Thus, is the book-cover to show a rose cluster, with leaves, buds and flowers, or is it to be an arrangement in separated buds or flowers alone?

The violet scheme shown on page 425 is a hint for the use of comparatively small flowers. While the field of design precludes nothing that is agreeably decorative, it will be found that the usual cluster or bunching arrangement is hardly applicable. Laying out the subjects—violets, for instance—in that regularity of form called conventional, will probably be found more agreeable.

Laying Out the Work

Just here may well be given a few points on the way to proceed. Let us presume that it is a book-cover of the size of the ordinary duodecimo novel we are designing, and that we are working with clover-heads, which we propose to reduce to two-thirds natural size; that also the camera is on the vertical stand, and the plate-glass exposing platform is before us. We first arrange a limit of size, either by cutting out a properly proportioned rectangle* from a sheet of pasteboard of any character,

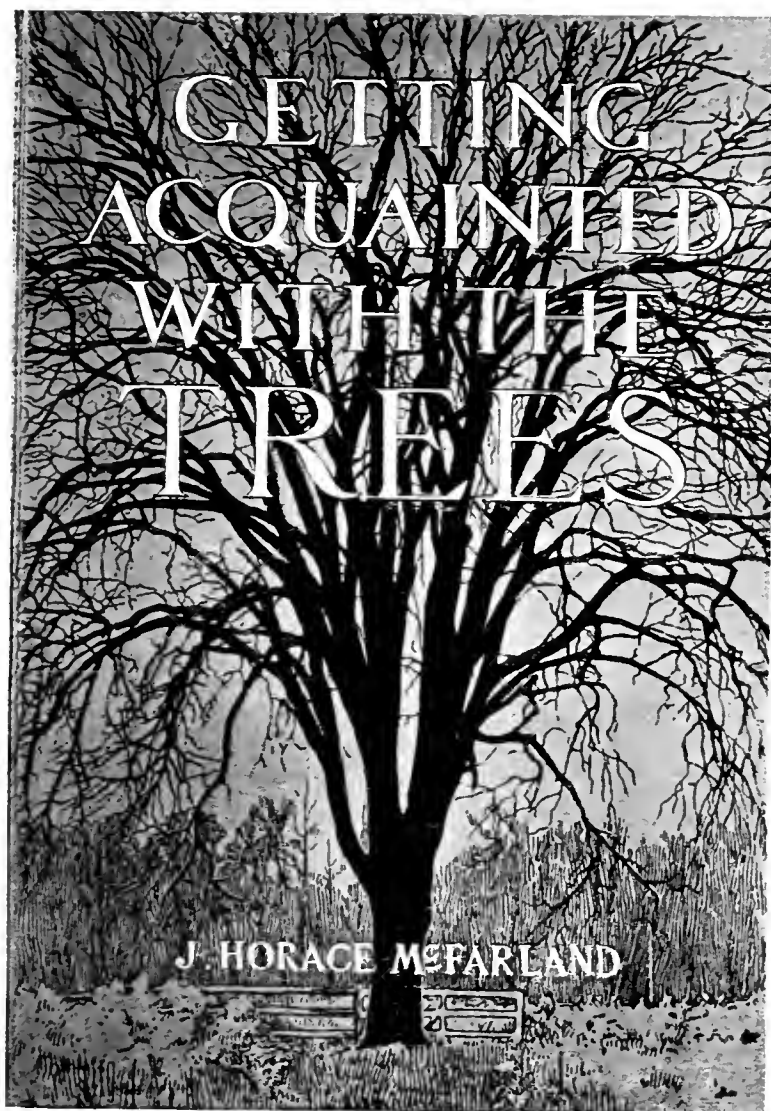
*A simple means of obtaining proper proportion is to add to length and width in equal ratio. If the design desired is to be 4 x 6 inches, the "lay-out" may be 6 x 9 inches, which will "photograph down" to 4 x 6 by one-third reduction. Or, if a diagonal line be drawn from, say, the lower left to the upper right corner of the book-cover rectangle, the point at which the upper right corner of any larger or smaller rectangle intersects this line will give exact proportion.

or by laying strips of wood or card on the glass to frame in the proposed dimensions, taking care in so doing that we are working from the lens as a center, so that our composition will come on the ground-glass properly. This done, and tested by looking at the arrangement on the ground-glass to note our exact limitations, we proceed to lay the flowers according to the idea that has been conceived for the design. Focusing should be done at once, so that the progress of the composition may be readily examined. To focus full size, or nearly so, is easier if the precaution is taken to use a sharp line to focus upon.

How to Focus Sharply A little device for this purpose is recommended in THE PHOTO-MINIATURE No. 13, but any scrap of printing may be used, if it has sharp, well-defined hair-lines on it. Place the scrap, not on the highest point—nearest the camera—but a little below that, observing with the lens “wide open.” As the focus deepens both ways when a smaller stop is used, the best average definition is thus obtained, and but little focusing will be required later. To hunt for sharp focus *without* the device or scrap of paper mentioned is to waste much time and risk poor results.

It will be discovered that much alike as all clover-heads seem to be, there are very considerable differences, and several “sides” to the blossoms. With a little experimenting, an agreeable arrangement may be secured, and then inspected on the ground-glass. Sometimes, or rather frequently, it will be necessary to trim out a leaf here, deftly lay another in place there, and otherwise to simplify or complete the arrangement. A leaf may run off the side to advantage, or it may be cut out entirely. Do not lose sight of the fact that you are *drawing* a certain design with objects and camera rather than with pencil and paper, and that correct handling of lines is just as important as if the implement used was the pencil and not the camera.

Lighting and Backgrounds The arrangement proving satisfactory, consider next the lighting and the backgrounds. The camera-stand should be readily movable, so that it may receive light at various



The graceful elm here offered an attractive background for the title of a book on trees. See page 430

angles. Usually light from the top or from one side gives the best effect. Sometimes a special idea requires different lighting. The background greatly influences the result, and must be taken carefully into account. If it be light, the leaves and blossoms will show darker; if it be black, or quite dark, more details will appear on

the stems and flowers, and they will seem brighter. Sometimes a neutral effect will be desirable. As the various cards used as backgrounds are well below the glass, out of focus, they may be tipped and moved variously to obtain just the effect that seems best. A few plates devoted to pure experiment in lighting, and to the effect of the use of various backgrounds in various ways, will enable the worker to operate with far more certainty than if such experimenting is included in the actual designing.

When all is ready, and the lens stopped down sufficiently to obtain depth and sharpness (usually $f/22$ or $f/32$), make the exposure; and by all means develop immediately, so that before the subject has been disturbed, the fixed negative may be considered and replaced with a better one, should it seem advisable. I do not go into detail of exposure here, presuming a certain proficiency on the part of the decorative worker, and only remarking that the negative should by all means tend to softness rather than to contrast, and show full exposure.

Market for Designs It is a pertinent question to interpolate here, given a satisfactory photograph for the book-cover design, how shall the unacquainted designer use the scheme? The answer is that there is always a demand among publishers for *good* designs. The properly made photograph is as much in the market as the drawing, and is translated into the brass of the finished book stamp by practically the same mechanical means.

Using a Whole Tree Another method of using a photograph as a book-cover design is indicated in the outlined elm, shown on page 429. Here the chosen tree was drawn upon the brass after the photograph, and also etched on zinc to use for printing the paper book-wrapper. Endless variations on these simple schemes, for the use of details and of complete trees or plants, will suggest themselves to the worker of any ingenuity.

Berries and Leaves There is great range of possibility in the berry-bearing shrubs and trees—as, for instance, the huckleberry, the dogwood, etc. Leaves also present charming possibilities,



Leaves of trees and many plants have unnumbered possibilities in decorative design for cover or "lining" papers for books, wall papers, printed fabrics and other uses. See page 432.

as witness the design worked out for book "lining papers"—the material used for lining the front and back board covers, and for the facing side of the first "fly-leaf." In this case the exquisite leaf of the liriodendron, or tulip tree, was used, the photograph being blue-printed, the design drawn in "line" over it,

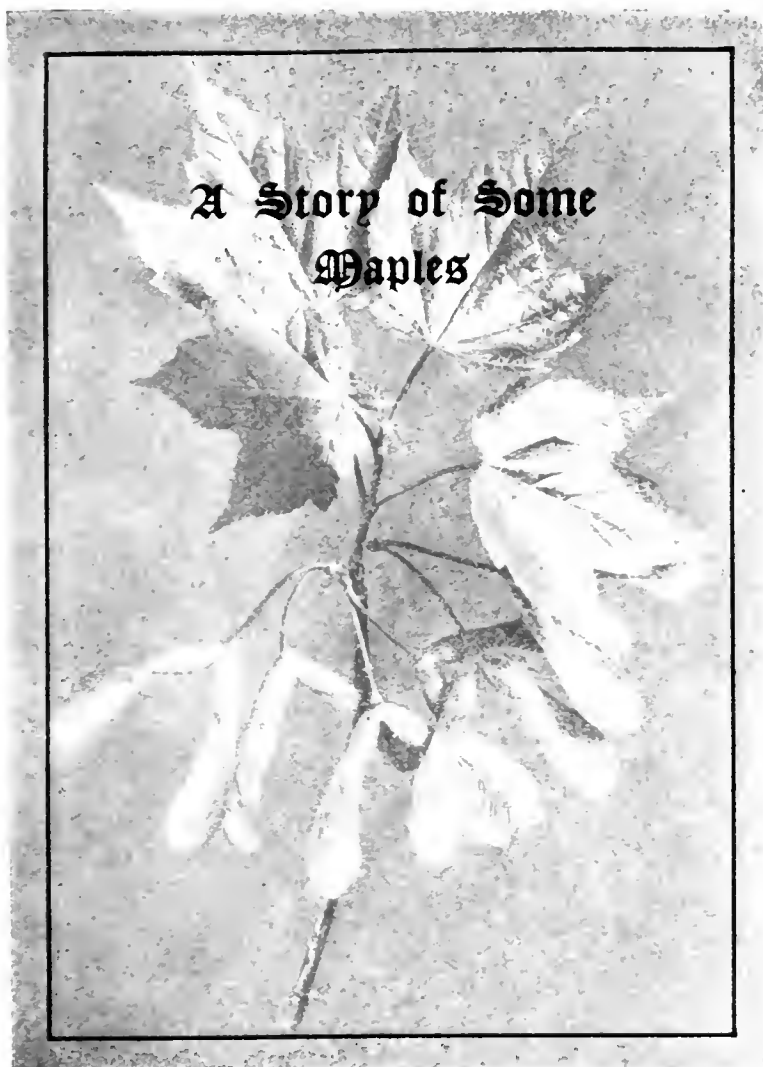
the blue-print bleached away, and the resulting black-and-white drawing used as a basis for an ordinary zinc engraving from which to print the "lining papers."

Again I say that endless variations may be made with leaves and blossoms for this interesting use. It will be noted that there is a certain conventional arrangement, but that also the design of the tulip leaf is treated with some freedom.

Another way in which a photographic design may be effectively used is shown in the "half-title" reproduced on page 433. In this case the selected photograph was printed in a gray tone under the black, but the effect here is much the same. It will be seen that the suggestion of a gray or tint undertone use of a decorative motive may be worked almost indefinitely, and with many objects. Where it is not practicable to design for two printings in the book, an approximation of the same effect may be produced by making a gray velox print from the negative—by under-exposure—and then drawing the lettering or other black design upon it with black ink. This will give in the half-tone engraving process a very pleasant and unconventional decorative result. To design for this gray or underprinting method, the negative produced should be fully exposed, and somewhat thin; otherwise it will be difficult to get the gray print to show proper detail. If the worker had the gray method in mind, but also wants a normal print from his composition, he should make two negatives, one somewhat over-exposed.

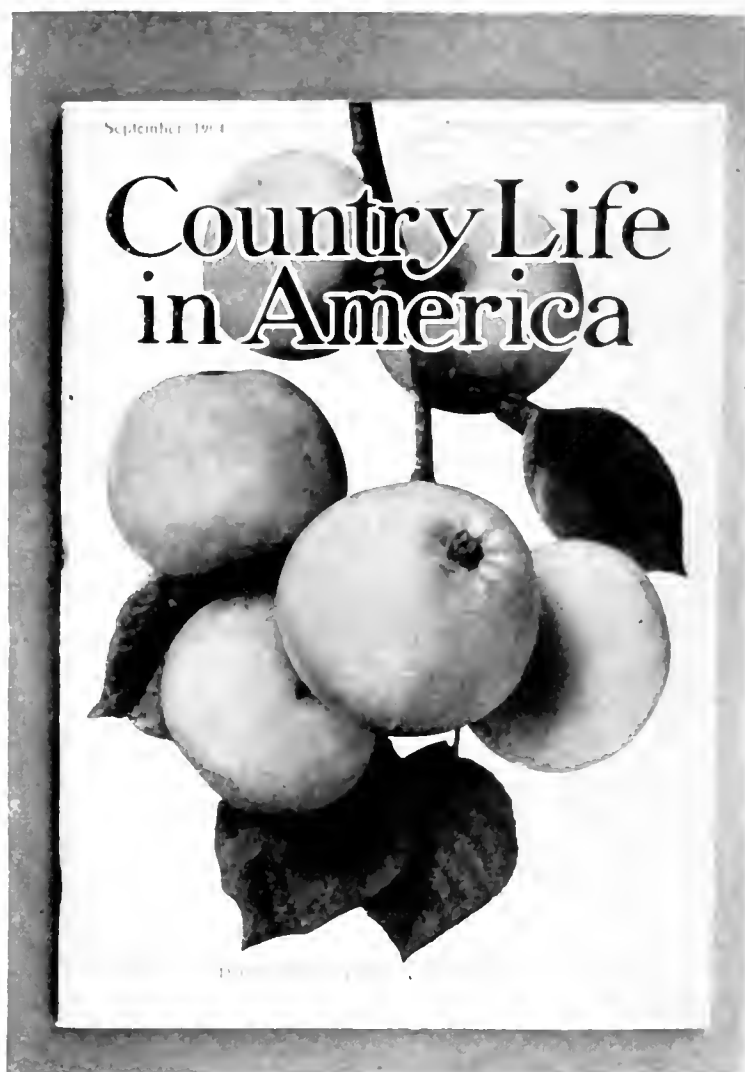
**Magazine
Covers** For the making of magazine covers photography offers infinite resource. To my knowledge, two prominent magazines have had few other than photographic covers in several years—and those not photographic were poor.

In undertaking this form of design, the worker should have in his mind a very clear idea of the end and purpose of his work. A dainty, delicate design may be pleasing in conception, and ever so hard to work out satisfactorily, and it may then be a dead failure, from lack of striking character. In most cases, magazine covers in these days are designed to attract the casual eye when displayed upon a news-stand.



A suggestion for the photographic decoration of the "half-title" of a book. See page 432

**"Striking"
Designs** Indeed, a "good news-stand cover" is earnestly desired and eagerly taken, if even remotely appropriate, by the publisher of any magazine. To have the "striking" quality thus implied, a design must be strong and simple, rather than delicate and refined. I have in mind a cover I designed, using as the motive the exquisite



A magazine cover design must demand attention by boldness as well as beauty. See page 435

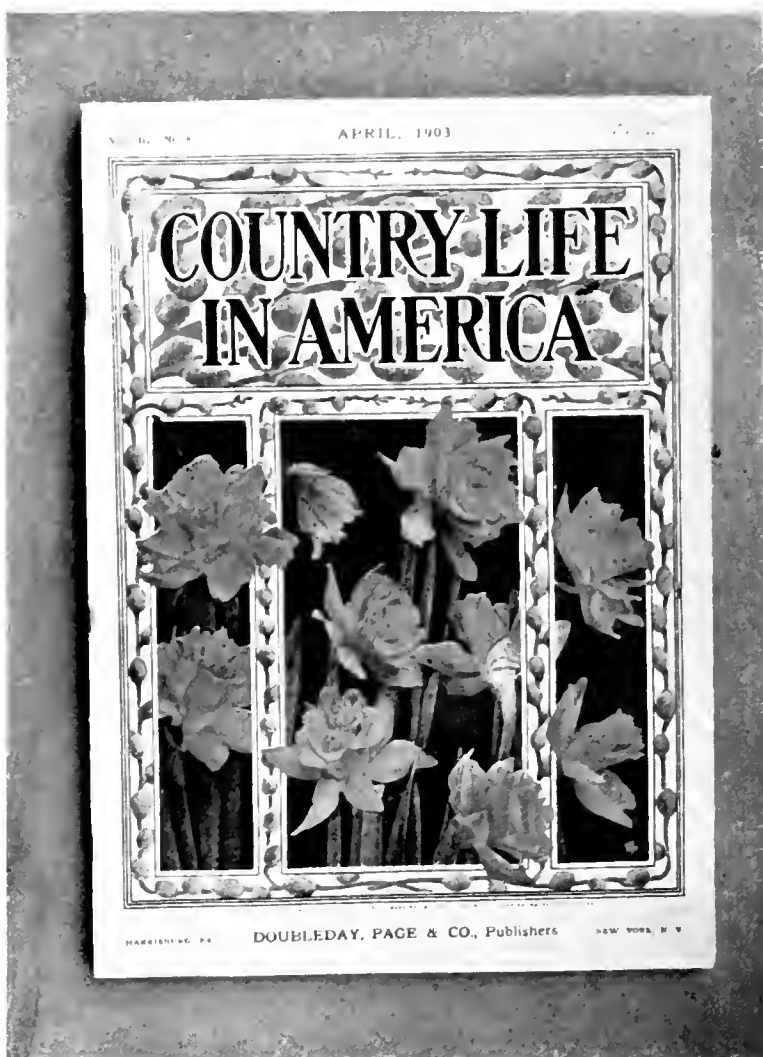
silky pods of the milkweed, as they are found in the fields in late fall or early winter. The result seemed most pleasing—to me—but the “dear public” passed by on the other side in silence, without being attracted to purchase the magazine on which it was used. The design required close attention to disclose its beauty, and it had no appeal at news-stand distance. The lesson, a hard one, was well learned, and ideas there-

after were tested from a different standpoint. The apple design, an example, well shows the attractiveness of size and simplicity ; and here is a point needing to be well enforced upon the student. The constant tendency in designing photographically is to overload the detail, or to complicate with too many objects. It is so easy to add another flower, another leaf, another fruit, to fill a temptingly vacant spot, and so difficult to take away, that only failures teach the necessity for reducing detail and complexity. It may be accepted as an axiom that the fewest possible parts will almost surely make the best design.

Photography and Drawing Another feature in this form of decorative photography is the combination design, using part photography and part pen or line work, each adapted to the end in view. The daffodils gain in effectiveness by seeming to break through the formal panels, in the case in evidence on page 436.

The dogwood "Country Calendar" cover on page 437 may be cited as an example of successful designing, the photograph having been helped out by careful drawing. At first, the controlling artist added a formal border that diminished the real effectiveness of the scheme. The publisher realized the need for breadth, and changed it before issue, allowing the original scheme to have effect by discarding the border and permitting the design to cover all the paper surface.

Direction of Line In all this work, as before hinted, the simple rules of design must be kept in mind. In every successful composition there is an agreeable direction of line, not the result of chance, by any means. Study any good example, and this intentional trend, inward or outward, but always harmonious, will appear. In using natural objects for photographic designing, the branch or twig or stem will itself often suggest to the eye open for direction the agreeable line. Insensibly, it may be, the line leads toward the object of attention or interest, but be sure that confusing or cross lines, or inharmoniously opposing lines, will, if permitted to dominate, ruin the best decorative conception.



The daffodils gain in effectiveness by seeming to break through the formal panels in this design. See page 435

Another part of modern magazine work that may be increasingly done by direct or adapted photographic designing is the making of headings of pages or departments, or the decorating of whole pages. A few years ago this was totally out of photographic reach, apparently, but now many excellent examples may be noted. The four "contents" pages shown here will serve to illustrate the

Magazine
Headings, etc.



A successful magazine cover in which the design covers the whole surface. See page 435

idea. The frame of pine-cones was worked out from the branches and cones by careful study of the possibilities in a rather stiff and inflexible subject, and its success is somewhat a contradiction, as the heaviest branch at the top should seemingly have been below. It will be noted, however, that it seems to bind and hold the open central panel—and that was the object. The wheat design ran into the binding of the magazine, and is an example of a most attractive, almost untouched field, among grains and grasses, sedges and

mosses, for exquisite decorative motives. The strong upright panel of the dog's-tooth violet emphasizes what has

been said about direction of line, while the water-lily heading also presents a scheme of broad horizontal effect, in which advantage had been taken of the natural curves of the lily stems.



Suggestions for "Contents" pages.
See pages 437-8

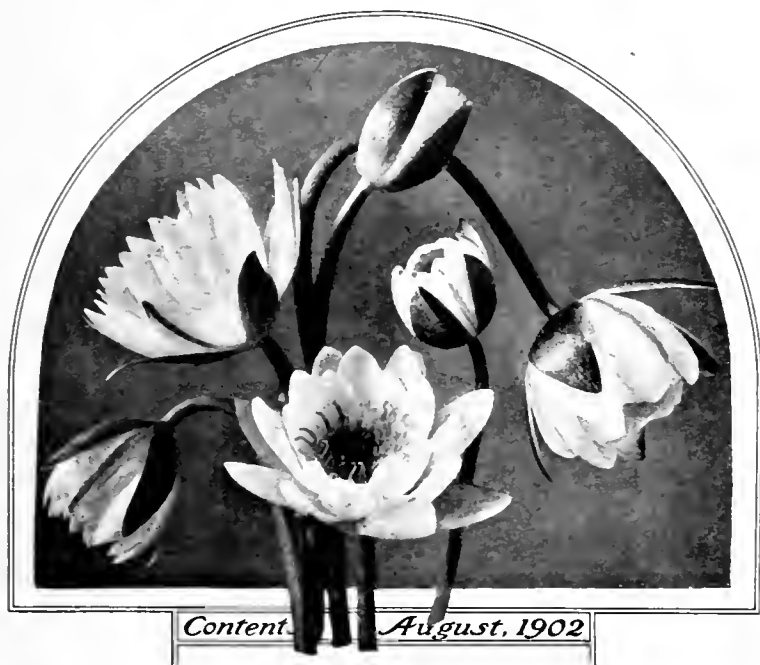


An Open Mind In using natural objects, the photographer needs to approach his work with an open mind. He should, of course, have a very concrete idea as to what he wants, and indeed may often begin

with a pencil sketch as a guide; but he should be ready to forget the sketch, whether on paper or in his mind, whenever the natural graces or peculiarities of the

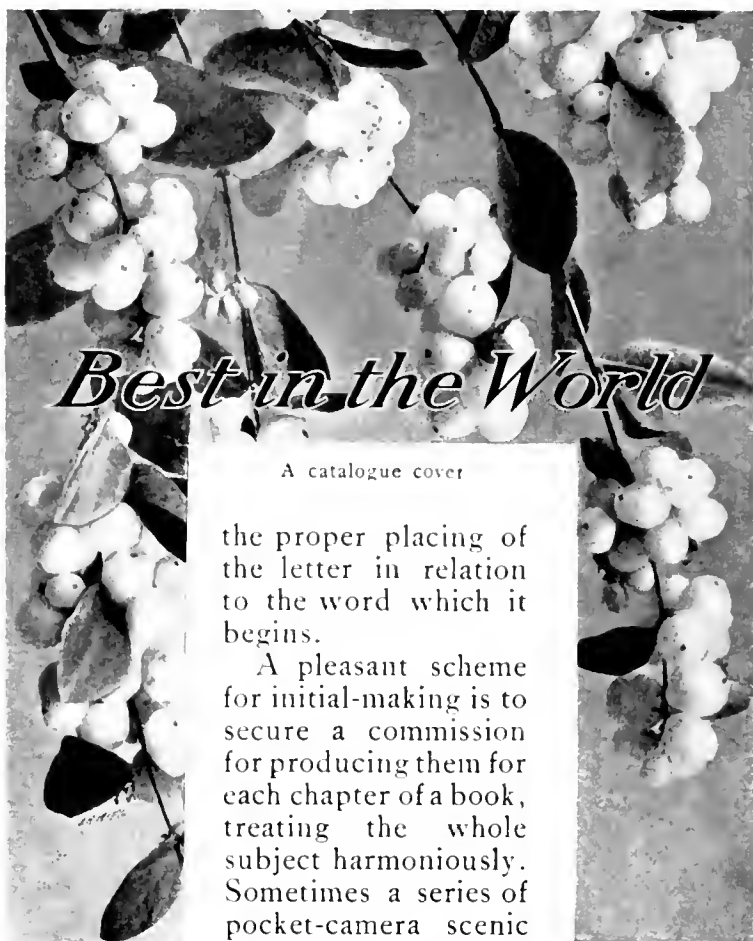
subject present another or a better thing. Many times, while trying to place in the preconceived arrangement a seemingly reluctant flower or leaf, I have stumbled upon a far better scheme.

Another fertile field for photographic
Initials cultivation is in the designing of decorative initials for books and magazines. Here again simplicity is all important, for the initial is



Water-lilies used to decorate a "Contents" page. This is applicable to many uses other than that here shown. See page 438

obviously rather small, and complexity means failure. The arrangement, also, should feel the influence of its purpose, in that the line should generally lead inward, toward the initial letter itself, and toward the printed page. I have seen some horrible examples in the way of initials in which a photograph had been used that necessitated the drawing in of the actual initial letter far from the upper right corner, and not close up to the word of which the first letter was purloined. The composition should always be so arranged as to permit



made to serve admirably for such use. Here again simplicity cannot too strongly be urged upon the photographer. The wide angle of the lenses usually fitted to the pocket-camera gives an opportunity to provide a central or striking object or figure as the motive, with the distance agreeably distorted by rapid reduction.

A wider market and an easier field in which to work decorative photography is in the designing of covers for catalogues and booklets, whose name is surely legion. When the sacred writer, in days of old, said that "of the making of books there is no end," he

Catalogue
and Booklet
Covers

had no remotest conception of the publishing interests of this age, in which one firm, and that not notably the largest, issues two books each business day of the year. For each book, probably a thousand "booklets" appear, and the catalogue production is probably many times greater.

Not all booklets or all catalogues are potential subjects for the camera man with the designing eye, but I believe I am safe in saying that an increasing majority of them may be photographically decorated, given only the acute attention of the man who knows how. To illustrate, I cite the case of a successful nurseryman, the front of whose catalogue had remained "plain" for years, the cataloguer alleging that his customers preferred it so. One day, without discussion, I laid before him a photographic snowberry design that had been carefully worked out. His only words were: "I'll take it; go ahead!"

Here was the point—the purely American point: When he *saw* the design, he wanted it at once; but if I had suggested the making of a design, he would not have been moved. We buy what we see, if we like it, and the acute merchant attracts by his accomplishments rather than by his promises. Therefore the photographer in this field must resolve to use his own brains in planning and making designs to offer, rather than to await commissions that will seldom come.

In designing covers for booklets or catalogues—and the line between the two is vague indeed—objects of any kind may be used photographically. While I might expect to attract the hatchet manufacturer by a suggestion of a cherry tree, it would have to be most obviously connected with the truth-telling desires of the father of our country to be more to the hatchet-man's fancy than a remarkably fine photograph of a young axe made by him. Machinery and tools, textiles, pottery of all sorts, shoes galore, corsets and lingerie—all these and countless other things have been and will be used decoratively and photographically in increasing measure as the workers rise to opportunity. The field is limitless, but not so easy that it is overcrowded, and the really good

The Design
Ready

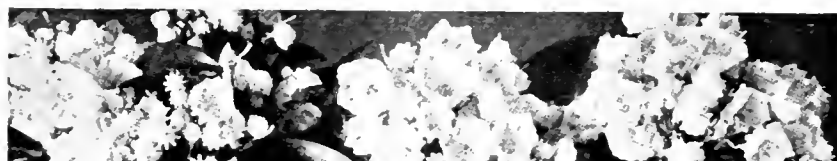
photographic cover design will always carry a good value to a ready market.

As the field is so wide, I can hardly attempt to more than hint at details and methods. My own practice has been rather large in extent, but limited in scope, and has dealt mostly with my favorite motives of trees, flowers, fruits and seeds. There is no reason whatever to feel, so far as I can determine, that the same methods will not bring success when applied in other lines and upon other objects. Indeed, since I have found the really exquisite beauty that resides in such prosaic subjects as beans and peas, I should feel an assurance of fair success in working out a design made with the free use of clothes-pins or with railroad spikes.

The frontispiece of this monograph is a color-design of the blue fringed gentian, used upon the cover of a nurseryman's catalogue. The effect of the dainty flowers is given in three printings, but it was enhanced greatly by the decorative treatment. The flowers seem to be on a panel, raised up by the simple device of drawing shading lines on two edges, and this panel was mounted on a piece of rough drawing board, so that when the whole was photographically engraved the texture of the drawing board was shown on the otherwise glossy and smooth cover. Thus the objectionable gloss was simply removed, and the dainty elegance and beauty of the flower properly set off.

Decorative photography, by the way, damages artists' conventions, at times.

I have never been able to find any artists' holly to photograph, for instance; the real thing is very different, and is sometimes hardly recognized, although much more beautiful. Some years ago I wanted a design to include that most strikingly elegant and purely American plant, the common maize, or Indian corn. A very competent and usually successful designer brought me a sketch showing ears of corn growing from the ends of the great stalks, and, when I remonstrated with him, he declared that he could find no authoritative corn photograph or picture



Flower detail may often be decoratively combined with an outdoor scene for
"Resort" booklets. See page 444

in any New York library! Since, I have taken pains to supply this need.

A Combination

The Eagles Mere booklet cover shows a treatment including an available flower detail combined with a landscape view. The central photograph, which extended also on the back cover, was surrounded by the laurel flowers characteristic of the place, with good effect.

In another and utterly different case, the customer had a phrase in mind that served as a text for the cover designs for two successive years, reproduced on page 445. A patient succession of efforts was necessary to

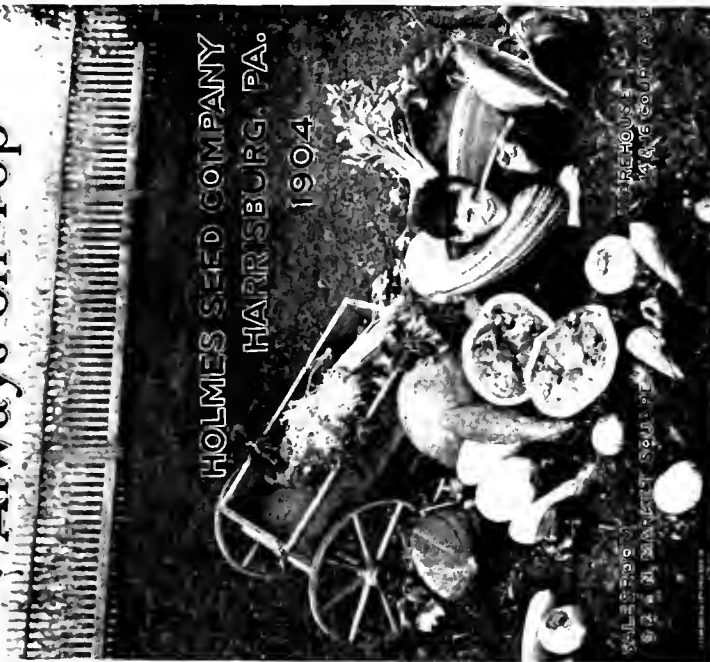
**"Faking"
Required**

get the right effect from the facial expression of the model, and an ingenious bit of "faking" was required to secure satisfactory results on the pile of vegetables in the corner of the 1904 cover, as well as on the basket crowning the boy's head for 1905. The quick exposures necessary in each case to secure the momentary expression on the boy's face required a lens too far "wide open" to obtain depth of definition on the vegetables. Therefore these were separately photographed under the same conditions of light and to precisely the same proportions, the design artist working them together and adding the background.

**Choice of
Backgrounds**

Here may be mentioned a point in design that ought always to be considered. If these two schemes shown in the Holmes covers had been worked on *white* backgrounds—the plain paper color—they would have lost much of their effect. The gray or neutral background tends to direct attention strongly to the central idea and to the lettering of a real advertising feature of the design. It may almost be taken as a rule that if the area of white paper surrounding a design doubles the area of high-lights and middle tones within it, the effect will be dissipated; while if by a neutral background the high-lights of the designs are emphasized, the eye will seek them naturally and the effect will be intensified. Calling to mind lantern-slides he has seen on the screen will enable any reader to test this dictum for himself, and I should be surprised to hear that any one considered a

Holmes' Vegetables Always on Top



HOLMES' HANDBOOK OF SEEDS FOR 1905



"HOLMES' VEGETABLES
ALWAYS ON TOP"

HOLMES SEED CO. HARRISBURG, PA.

Two attempts to get "Holmes' Vegetables Always on Top." See page 444

succession of white skies as agreeable, while all will remember the charm of views with clouded skies, or those in which the dark and middle tones of foliage serve to rest the eye and to direct attention to the main objects of the composition. The proportion and placing of the masses of white must be considered.



Three designs of catalogue covers. The two on the left are photographic designs from life, the right-hand cover being a lithographed design. Note the naturalness of the former compared with the latter.

On this page three cover designs A Comparison are shown in comparison. The two subjects to the left were photographically composed; the other was lithographic work. There

can be no question as to the more agreeable character of the photographic designs, nor indeed as to their accuracy and naturalness. Particularly do I direct the attention of the student of design to the bean picture at the left, asking a consideration of the pleasing and attractive lines it presents.

This subject of the designing and photographic means of covers for catalogues and booklets might be exemplified and extended to great length, but I think enough has been said and shown to set forth its pleasing possibilities to the earnest and ambitious student.

**Decorative
Advertising**

A field for the photographic design worker that is almost limitless in its use and in the market for good designs is concerned with the making of schemes for magazine advertising. The pages of any of the leading magazines will prove this in the increasing use of photographs. For this work, almost any striking thing is useful, for the advertiser's first desire is to attract attention. Where the design is appropriate to the article to be advertised, it is all the better. For instance, I remember the pleasure an assistant of mine had several years ago in photographing his baby in the several stages of anticipation, demand, enjoyment and satiety as to a food preparation. His pleasure was not diminished by the satisfactory price paid him for the negatives by the manufacturers of the food.

The adaptability of flowers and the like to this phase of decorative photography is obvious, and much that has been said previously in this monograph will fully apply here. A point for consideration always is in connection with the proper location of the necessary wording. The composition should be so spaced that lettering may come in without destroying the design, and the worker must remember that the design is valuable only as it calls attention efficiently to the merits of the article advertised.

**Use of the
Model**

There is an increasing tendency toward the use of figures in this sort of work, and that means more difficulty for the worker, as well as better compensation. The proper posing of models is an art by itself, and, while

the subject is entirely germane to this discussion, I do not introduce it more than in the way of a passing mention, lacking that personal experience which is the basis of this monograph. I merely hint that patience and "a way with children" have been known to produce most pleasing results in designing for advertising.

**Christmas
Cards**

For the home worker who wishes to make his holiday-giving distinct, and without flavor of the shops, and also for the ingenious designer who may want to work to a financial profit, the making of photographic Christmas cards will be interesting. Such cards are individual, and therefore far more pleasing to the recipient, usually, than the stock designs of the stores. A way to introduce a Christmas flavor into the productions, while also retaining the personal element, is to provide several negatives of holly, laurel, galax leaves, Christmas trees, ice-covered twigs, and other easily recognized holiday motives, arranging to mount these on the same card as the print from the purely individual negative. One able to draw letters successfully may also produce a Christmas wish in verse or prose, photographing it to any smaller size for use in connection with a picture bit that will be readily recognized by the recipient. A phrase of holiday cheer may be drawn upon a Christmas toy ball, with care, and keeping well inside one-third the circumference. This, photographed as hanging from a bough of a Christmas tree, with proper attention to lighting, will form a pleasing part of the card.

The Christmas dinner may have a photographic menu card, such as shown under a later heading on these pages. I remember one joyful occasion of this kind at which each guest found at his plate a red ribbon, which, when pulled at the arranged time, drew from the concealment of the center-piece a small photograph having a special appeal to him and bearing the felicitations of the day.

With just these hints, the home worker will see many ways in which the camera will provide charming adjuncts to the holiday giving, with a personal point that is always pleasing. Let me hint, however, that the best way to work is to provide the essential negatives a year

in advance. Photograph the Christmas tree, or decorations, or the church adornment, or some occurrence of the day, sure that it will be valuable a year hence.

The same suggestions apply to Easter, **Easter Cards** now becoming almost as much a festival of joyous giving as is Christmas. The Easter opportunities are, however, decoratively much greater, as it is the custom to have many flowers in bloom at that time. Lilies are especially significant of the day, and all the spring-blooming bulbous flowers, as hyacinths, tulips, daffodils and the like, are in order for Easter remembrances. Of course one could not forget the lily-of-the-valley, most dainty and charming of spring blooms, and one, too, that will tax the decorative photographer's skill to the utmost, while as well rewarding him most richly for real success.

In obtaining negatives to use for making Easter cards care needs to be exercised, to work with the idea of simplicity of arrangement always in mind. I reiterate this, even though it become tiresome; for complexity has spoiled more floral compositions than any other fault. A single tulip, with its foliage; one rose and perhaps a bud; just two or three lily-of-the-valley blooms with their leaves—these, thoughtfully handled, will provide negatives of much value. The elusive beauty of the violet and the pansy may be put on glass, given enough plates and patience.

Naturally, the use of photographically decorated cards will appeal to the **Birthday Cards** worker who must remember the natal days of his friends. A bit of a portrait, a scene in which the friend has had a part; a familiar flower, a nook in the home—suggestions will make themselves, almost, for anniversary use.

For all these uses, let me mention a plan that sometimes helps greatly in the finish of the result. Lettering is often essential to the card scheme, and many times the negative that seems appropriate is not the correct size. To mount the desired print on a proper card, to draw or write on it the words or phrases necessary, and then to carefully photograph the whole to the selected size is not very difficult.

**Selection
of Mounts**

Just here there is opportunity for obtaining a pleasing result. The photograph may be mounted on a rough or pebbled cardboard, or on some form of bookbinder's cloth, or on one of the modern "art" mounting or cover papers, the texture of which will give a pleasing ground to the photograph. The words may be drawn directly on the mount, or on smooth or contrasting paper, and carefully put in place. A little shading with brush or pen will give a panel effect that is very attractive if properly done.

This plan is not available usually unless there is to be a considerable reduction in size, because of the difficulty of photographing a photographic print without losing much of the detail. If there is a fair reduction, and if the lighting of the scheme is so managed as to avoid exaggerating the grain of the photographic paper used for the original print, very good results may be had. The calendars and menu cards shown in these pages give proof on this point.

**Making
Calendars**

Obviously much that has been written in the last few pages applies as well to the making of calendars by photography. There is no way in which the ingenious amateur may more agreeably and economically remember his friends at the holiday season than by a photographic calendar. I remember how at one New Year recurrence I helped greatly a public improvement by this means. It was desired, in my home city, to add to the park system a tract of native wild land, covered with trees and flowers, but practically unknown to most of the influential citizens of the town. It was winter, and a visit to the place was impracticable. I had a dozen or more good negatives, made in the natural park that it was hoped to have taken by the city, and I produced a score of calendars, choosing each photograph with special reference to its recipient. Neat little calendar pads were attached to the dark cards upon which the prints had been mounted, and a letter calling attention to the view accompanied each card as sent by messenger on New Year's Day. The effect was remarkable, for nearly every man responded with a personal note of thanks and apprecia-

tion, and I saw the calendars hanging in the offices of these gentlemen all through the year then begun. The park proposition was helped, and it has since been successfully consummated.

For home friends the calendar is a pleasing way of reminding and of complimenting. The little pads to attach may be usually bought of the stationer or the printer, and the silk cord or



Suggestions for calendars.



suitable narrow ribbon that serves as a hanger can be of a color that the sender knows will please the recipient. Two examples are reproduced herewith, merely as suggestions. The round and oval shapes of the prints resulted from the use of brass forms, and on the calendar showing the snowy woodland the line around the picture was ruled with a blunt knife.

**Calendars
for Sale**

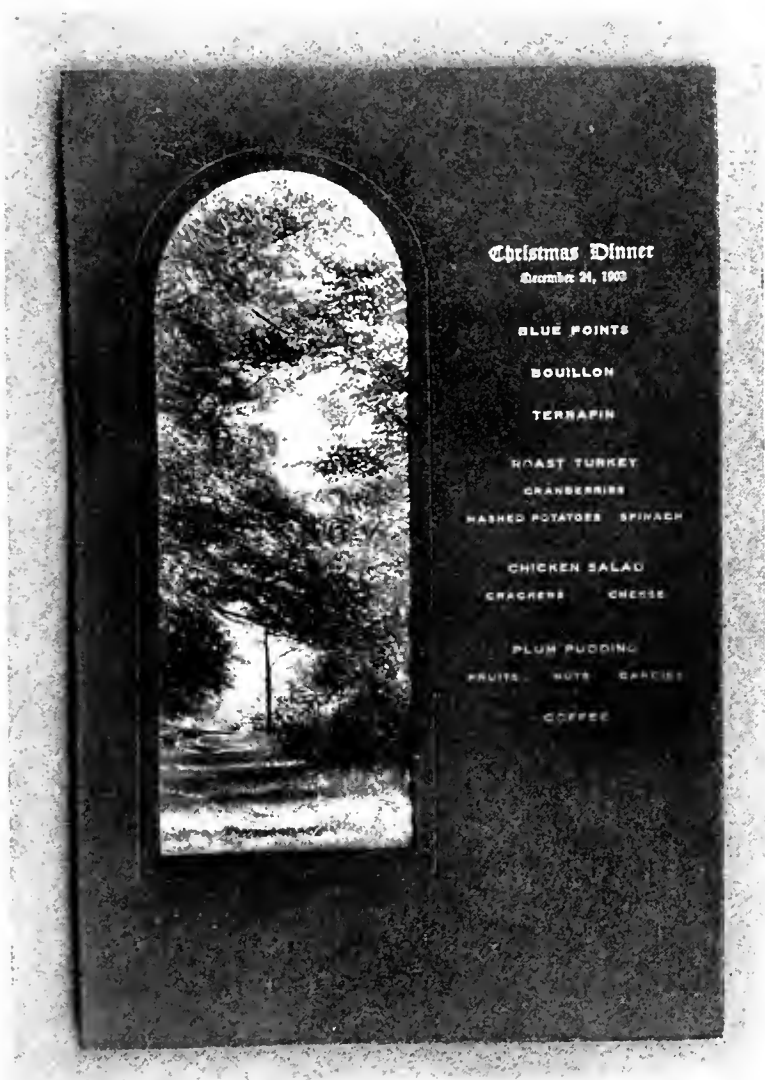
There is another form of calendar making, however, that will provide a financial reward, if it be well managed. It is to make a local calendar, in three to twelve sheets,

for sale in the home art- or book-stores. To produce this the decorative worker should begin a year ahead, to plan and obtain suitable seasonable negatives. He should decide as to his first attempt, whether to produce a calendar with three, four, six or twelve leaves. Then he may look out for subjects that suggest the months and possibly the local conditions. A familiar and attractive view, made with snow trimmings in winter, as the leaves break in spring, in full summer maturity, and with bare twigs for fall, is an example of the treatment. Or three, four or six views of characteristic scenes at various times; suitable flowers—these may be very closely associated with the months—or fruits may be used to make a consistently attractive series. Pictures of a child in seasonable garb are always satisfactory if handled so as to get the unconscious charm of youth. A multiplicity of subjects will present themselves to the designing mind.

Calendar The adding of the calendar features
" Pads " may be in several ways. The pads may
 always be had a year or more in advance,
 and six, four, three, two or one pasted directly on a card. By the use of the suggestion made for Easter cards, a pleasing and easily worked scheme may be arranged. To use out this idea, have the main design somewhat larger than it is intended to use it, and mount it on a card or paper of proportionate size, so that the whole may be carefully photographed together. Due caution must be exercised, in this copying method, to give full exposures, and to light so as to avoid the grain or gloss of the paper, as previously noted.

If the decorative worker is in anyway apt with crayon, brush or pencil, the months and dates can be drawn right on to the photograph, or the printed dates may be decorated or improved by careful handling. In the same way, a decorative treatment may be given to the selected photographs that will aid in an attractive or a profitable result.

"Half-tone" If the design is to produce enough
Calendars calendars to make a considerable sale,
 the making of photographic prints will
 be found onerous and expensive, and it will be imprac-



By varying the photograph, each guest may have a menu card embellished with a familiar scene. See page 455

ticable to use any drawn or painted decorative addition. Here the modern perfected engraving processes come in; for, by preparing one careful outfit as "copy," the production through the half-tone reproductive process of any number is rendered simple and cheap. It is not worth while or economical to undertake this for fifty or even a hundred sets of calendars, but for larger

Thanksgiving

November 21, 1905

Oysters

Clear Soup

Salmon - Sauce Tartare

Roast Turkey ; cranberries;
mashed sweet potatoes.

Crème-de-menthe sherbet

Quail - Lettuce à la France

Hot Mince Pie

Ice cream ; cakes

Wafers; Brie Cheese

Coffee

SAUTERNE
CLARET



Here the menu was lettered on the photograph itself, which was then copied. From this negative menus were made on platinum parchment in sepia tone

A. Tauxe

numbers it is entirely in line. To work with a capable engraver is necessary, as the cheap "square-inch" man, who makes a dab at a photograph and delivers the result as satisfactory, is sure to cause disappointment.

In proper hands, within two or three per cent of the beauty and gradations of a proper photographic or drawn "copy" can be held in the engraving, and the interested and skilled master-printer will put the same beauty on a thousand impressions.

Before leaving the smaller items, I
Menu Cards should mention the pleasing possibilities in the making of photographic menu cards, adapted to special occasions. In the Christmas dinner card shown on page 453, various familiar scenes were selected, and each card was individualized for the guest. The menu was printed in white on a carbon black card, and the name of the guest also added. The effect was simple, elegant and satisfactory. It would not have been impracticable to have photographed the menu words, giving entire independence from the printer, for a home dinner.

In another case, this was done. The event was a dinner to city officials, given by the mayor of the city. At the top and the bottom of the card were mounted selected views of the city, and between, the menu carefully drawn, with a blank for the name of the guest. The whole was photographed down to convenient size, and the negative printed very carefully on portrait Velox, keeping absolutely clear whites. When mounted on a carbon black folder, the effect was very satisfactory, as well as unique.

Enough has been written in these
General Schemes pages to offer ample suggestions to the interested and acute worker for many effects not even hinted at. The camera will prove, in facile hands, a decorative agent of breadth, profit and power, especially for these smaller items.

Keeping entirely clear of the use of
Photographic Room Decorations framed pictures of various kinds, there is yet unconsidered a most striking opportunity to use photographic decorations in the rooms of the home or the shop. In these days

the tendency seems to be toward a recurrence of strongly figured wall coverings. I remember the joy with which a talented and tasteful woman told me that she had unearthed twenty or thirty rolls of wall-paper, made some fifty years ago in a strongly decorative way, showing not a small, constantly repeated figure, but a broad, sketchy design, with which she wished to adorn her new dining-room in the vogue of the present.

An Onion Motive The plan I am about to suggest affords opportunity to exercise the talent, taste, skill and fancy of the home-maker

upon the walls, and the result need not be of a character to cause one to see flaming grapes in a nightmare, or to have a Japanese delirium. The idea is simply to select some object that has decorative possibilities, to photograph it with due consideration of its lines, and to make enough prints to serve as a border next a wainscoting, or as a frieze above the picture railing, or, indeed, below, if the general plan of the room will so permit. Curiously enough, the photograph which gave form to this idea was of an object not usually considered decorative in any sense, or, indeed, in any way beautiful—namely, the odorous spring onion! Two of these silvery skinned vegetables, with their green tops, had been photographed in a pleasing composition, and several prints, lying close together, produced promptly the thought of a repetition which would be decorative. Since then, after much study and experiment, the plan has been tried with entire success and satisfaction, and it is confidently recommended as a way in which the home rooms may reflect, not the ideas of some decorative wall-paper artist on the other side of the world, but the best thought of the people in the home.

Placing of Lines In planning for this sort of a decoration, one must avoid the pitfall of a bad placing of mass or lines. For instance, as I write I am looking at three unsuccessful examples which promised absolute success when they were planned. One is a cluster of two peaches with their leaves—a beautiful negative and a charming picture. Repeated, however, the peaches tend to carry the line across the room instead of up and down, and they give

a spotty effect that is not pleasing. Again, I look at a very beautiful orange with its foliage, also apparently decorative, because the direction of the line is beyond criticism. But here, again, the mass of high lights makes the use of it for the decorative frieze that was planned entirely unsatisfactory.

The onions above mentioned are entirely successful. A bunch of cucumbers bade fair to do perfectly well; but here a false direction of line, leading the eye outward and away, has made the little section of frieze in my experimental room anything but pleasing. Next to it is a joy, a section devoted to a bunch of celery, which has been repeated so that it gives a smooth, clean and altogether pleasing effect, beyond criticism as to mass color and line, and ideally satisfactory for a dining-room decoration.

Vegetables in Decoration It will be observed here that I have spoken familiarly of vegetables as decorative, and I do so purposely and advisedly. Some years ago my work made it necessary for me to undertake the photographing of vegetables in full size with the vertical camera-stand described in *THE PHOTO-MINIATURE* No. 13. I will confess that I undertook the work with some displeasure, because it seemed to me that I could find more pleasing objects to work with, if I were given any choice, than the prosaic vegetables of the markets. No sooner, however, had I undertaken to make composition of peas and beans, the first objects it was necessary to handle, than I discovered the most attractive possibilities. Delightful arrangements of lines proved to be practicable, and there was enough difficulty in the composition, in the lighting, and in the proper exposure, to make the satisfactory results that finally came all the more pleasant to consider.

In this experimental room I look also at a section devoted to a bunch of white grapes photographed on a dark background, almost full size, and entirely in the proper key in every respect. While the grapes carry high lights, these lights are so distributed in the bunch as to avoid the spottiness that spoiled the oranges and peaches before mentioned.

Presented with this are little sections of a frieze, to show the effect of the grape massing, and another of a composition of daffodils, the latter of an entirely successful character. I have in use other motives, including roses, carnations and other suitable flowers, and I have selected from among my negatives an iris subject that promises well.

I believe the pictures shown herewith and the hint given in the paragraphs that precede explain the idea of this individual decorative plan for the living-rooms. It is hardly necessary to say in extension that the thoughtful worker who is after pleasant effects in his own home will have no difficulty in making his selections for the various rooms. He will turn at once to vegetables or fruits for the dining-room, perhaps, unless he is a fisherman, to give him a chance at real trout. He will want flowers for some of the other rooms, and his own imagination or taste will doubtless lead to the use of motives of which I have not even dreamed. I can therefore drop the consideration of the idea and give a little

Doing the Work

attention to the method of doing the work, which will avoid for the interested decorative worker who attempts this scheme, now, I believe, for the first time mentioned, some of the pitfalls I have had to climb out of. It will be obvious that small prints will not be satisfactory for this decorative idea. The whole-plate size, $6\frac{1}{2} \times 8\frac{1}{2}$, or better yet, 8×10 , will give enough of flexibility to render the work possible. Or even better yet, a 10×12 negative, if the worker's pocketbook will stand the expense of the many prints, will aid in producing, under the handling of good taste, a superb result. It needs to be said, though almost obvious, that but one motive can be successfully used in a room, in accord with all the principles of decorative art. I may as well confess that I did not believe this, and I therefore used in my experimental room eleven motives in as many panels, proving fully that but one was desirable.

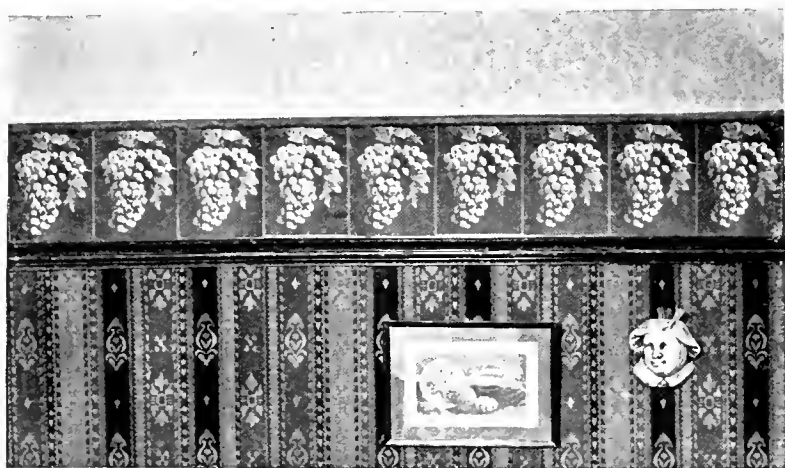
An Even Background

In photographing, an attempt must be made to get an absolutely even tinting of the background, so that when the prints are repeated there is no disagreeable break in

tone. Some very pleasing negatives have had to be rejected because of failure in this respect. I do not by this mean to indicate that white backgrounds are necessary, or even desirable; for so far as I have pur-



Section of friezes suggesting the use of photographs of flowers and fruits in life size. See page 455 *et seq.*



sued this subject they are seldom available, detracting too much from the detail of the motive unless it is extremely light and airy in outline. A medium background, such as could properly be called neutral, and

such as is usually afforded by a dark gray cardboard below the glass exposing-stage of the vertical camera-stand, gives the best average results. Here again the interested worker will experiment for himself, and he may easily prove me to be entirely wrong in this matter of the tint of backgrounds.

Uniform Prints Next I need to mention that to secure the uniformity desirable the prints must all be alike in tone. For a room of comparatively small size forty or fifty prints will be needed, and they should be absolutely uniform, if that is possible; but if it is not possible, they should be as nearly uniform as they can be made, and should then be selected, so that the differences are imperceptible when they are placed one next to another.

I find that with the very best of care in this respect there will be differences, and I have evolved a plan for helping out these differences. It consists of pasting a thin strip of paper of a color harmonious with that of the background, but a little lighter or a little darker, between the photographs as they are mounted for suspension on the wall. This strip of paper should not be over one-eighth of an inch wide, usually. It will panel the motive and cover the joints.

By far the easiest way to handle this scheme is to paste the photographs on linen mounting cloth. They are then in flexible shape, and can be managed readily.

The Tone of the Prints The tone of the photograph is of very great importance, and depends, of course, on the color of the room which is to be decorated. The experimental room in which I sit has walls of green burlap, with a dark brown stained wainscoting. The black-and-white tones of Portrait Velox were cold and unsatisfactory, but the brown tones of Eastman Sepia, or the richer browns of the re-developed Velox, are just right. The carbon printer, who has at his command a great range of colors and tones, will find no difficulty in fitting any color scheme. Parenthetically, well-made blue-prints of uniform tone will be found exceedingly dainty and pleasant in a room with light walls, that will stand the juxtaposition of masses of rich blue.

**No Glass
Covering**

When this photographic frieze is finished, it needs to be considered as a part of the wall scheme, and not as a picture hung out of sight. It cannot be covered with glass, therefore, as the reflection from the glass will spoil the general effect, which should be soft. If the prints are carefully made, fully fixed, and well washed and toned, so that they are permanent, there should be no difficulty about durability. A mat varnish would assure permanence. Where the frieze has been hung under a picture-rail I have bound it by a small round molding, completing the frieze idea; and in the same way a treatment above the picture-rail seems to be obviously incomplete without some slight binding.

I am of opinion that there is a fascinating possibility for home decoration in this photographic frieze scheme, and I believe as fully that it can be worked out by some photographer with taste and ability into a profitable means of providing unique and individual decorations for people of wealth and taste, who have not the skill, time or inclination to do such things for themselves, but are willing to part with the coin of the realm to the artistic decorator who can give them something that no one else has, probably, from motives obtained on the place and absolutely suiting the environment.

To plan photographic motives for decorating pottery; to furnish patterns for fine linens; to get rid of the artistic abominations and conventionalizations that make some woven fabrics anything but beautiful, when they might be beautiful; to plan motives for wall-papers that will be the real thing; these and scores of other possibilities are ahead of the decorative photographic worker, who takes up, with courage, skill and taste, a line of work that is as yet practically untouched, or at least undeveloped.

J. HORACE MCFARLAND.

NOTE.—All the examples in the foregoing pages are from Mr. McFarland save the one on page 454.

Notes and Comment

By inadvertence, no mention was made of Hammer Orthochromatic Plates in our last number, dealing with *Practical Orthochromatic Photography*. These plates have been on the market about three years, and, like all who use them, we ourselves value them for their splendid qualities. They are made in three grades: Slow, extra-fast and non-halation, the slow grade possessing exceptional color-sensitiveness where its use is permitted. Readers experimenting along the lines laid down in THE PHOTO-MINIATURE No. 67 will find much satisfaction in a practical trial of Hammer Orthochromatic Plates, a light yellow screen being advised if the light is bright.



One hundred dollars in cash are offered as prizes in a new Ray Filter competition announced by Burke & James, Chicago. There are two classes: I. Landscape, with cloud effects; II. Flowers, draperies, paintings and miscellaneous subjects (prints in duplicates). The rules of the competition are:

1. Exposures must have been made through a Burke & James Ideal or Isochrom Ray Filter.
2. All prints must be submitted on or before November 1, 1905, addressed Burke & James, Prize Competition, 118-132 West Jackson Boulevard, Chicago, Ill.
3. All prints submitted must be mounted on cards, with owner's name and address on back of card.
4. Prize pictures are to become the property of Burke & James.

For purposes of comparison and to show color values, it will be required that all negatives in Class II be made in duplicate (one with and one without ray filter), and a print from each to be submitted.

Names of prize-winners will be published in December issues of photographic magazines.

Note.—Class II is open to all pictures of vari-colored subjects, such as flowers, draperies, mosaic floors, rugs, costumes, pictures, fancy colored china, etc., etc. Negatives to be made in duplicate and print from each submitted, as per rules of competition.



The Carbutt Dry Plate Co. is again in operation at the old stand, Wayne Junction, Pa., under the management of Mr. John Carbutt and his sons. In an early issue we hope to report our experience with new samples of plates recently received.



Another interesting competition, with \$300 in prizes, is that announced by C. P. Goerz, New York, for the purpose of securing a photographic cover design for a new lens catalogue in preparation. This competition should appeal peculiarly to readers of this issue of THE PHOTO-MINIATURE. Under the following rules the competition is open to all:

All pictures sent in for competition must be from negatives made with a Goerz lens. State number and series of same.

Prints only are to be sent in—not negatives.

Prints must be mounted.

Every print should be marked on the back with the “nom de plume,” or pseudonym, of the author. A sealed envelope containing this pseudonym as well as name and address is to accompany each shipment.

All competing prints are to become the property of the C. P. Goerz Optical Works.

The negatives from which the prize-winning prints are made to become the property of the C. P. Goerz Optical Works.

No employees of the C. P. Goerz Optical Works will be allowed to compete.

In sending the pictures, mark the package visibly “Goerz Catalogue Competition.”

The awards made by the jury are final.

The pictures sent in will be judged exclusively for their artistic and decorative effect and for their appropriateness as a cover-design.

This competition will close the 30th of September at midnight. All prints sent after that date will be excluded from the competition.



A recent issue of the *Baltimore American* gives an interview with Mr. Meredith Janvier and an account of his new home studio at 14 W. Hamilton street. Mr. Janvier has made a long and careful study of photographic portraiture from the art viewpoint, and his work thus far shows unusual promise. We hope ere long to show some of his recent work in these pages.



An exhibition of photographs "worth while" is on view at the New York office of the G. Cramer Dry Plate Company, 93 University Place, near 10th street and Broadway. It comprises prints from negatives by Pirie MacDonald, E. B. Core, J. Horace McFarland, Rudolph Eickemeyer, Jr., Mrs. J. E. Bennett, Henry Troth, Curtis Bell and other prominent workers in our little world of photography. The moral of the exhibition, which includes many things of interest to progressive workers, is: "Made on Cramer Plates." Mr. E. L. Somerville, eastern manager of the Cramer concern, deserves much praise for his enterprise in getting such a collection together for the pleasure of Metropolitan photographers and visitors.



Simple and ingenious in the extreme is the new exposure meter "Simplex," announced by the Knowlton Company, Woonsocket, R. I. A piece of orange-colored celluloid with a disk carrying a graded series of small holes and a few lines of print on its face—such is the Simplex Exposure Meter. The exposure is determined for any subject by looking through the holes at the object to be photographed and finding the smallest hole through which the detail of the shadows can be

seen as clearly as without the meter. We tried it, in sunlight, on a dull day, and by gaslight in the home, using the Film Pack. It worked like a charm.



After several years of preparation and delay the Lumière North-American Co., of Burlington, Vt., has placed on the market a full line of plates, labeled *Sigma*, *Green Label*, *Yellow Label*, and *Orthochromatic A, B and C*, *Non-halation*, *Lantern* and *Transparency*. Of these we have tested the *Sigma* brand and find it extremely fast (Wynne 90), with an unusually fine grain and good range of gradation. Full information can be obtained from the New York agent, Mr. J. E. Brulatour, 49 West 28th street, New York City.



Since the note on page 402 of THE PHOTO-MINIATURE No. 67 was written, we have had further experience with *Colorprinte*, the new pigment paper which gives prints in colors from ordinary landscape negatives. After a little practice and familiarity with the characteristics of *Colorprinte*, one gets the habit of making good prints. Unless we are mistaken, the introduction of *Colorprinte* will give a much-needed impetus to amateur photography this summer. A trial equipment for 4 x 5 prints can be had for \$1 from the manufacturers, Howe and Hall, of Chicago, but we understand that supplies for *Colorprinte* will be obtainable from most dealers by the time this note appears.



According to the advertisements, new catalogues have been issued by the Eastman Kodak Co., the Century Camera Co., the Rochester Optical Co., and the Blair Camera Co., all of Rochester. Not having been "favored" with copies, we are unable to tell our readers of their contents.



The re-introduction of Ross Lenses on this side of the Atlantic will be hailed with pleasure by thousands.

of amateurs who have read about the famous Ross *Homocentric* in foreign journals but have not found it for sale by American dealers. Catalogues can be obtained from the American representative, Simeon Trenner, American Tract Society's Building, Nassau St., New York, who will carry a complete assortment of Ross Lenses. In our use of the *Homocentric* during the past two years we have come to consider it an ideal objective for all-round work and, in a special way, for hand-camera work on dull days.



Tank development is coming strongly to the front this year. The Eastman Kodak Co. has just put on the market an ingenious Tank Developer for Roll Films; G. Gennert announces the Auto Tank Developer for plates; and Messrs. Burke & James are about to introduce the Ingento Developer for the hand development of Roll Films. Detailed information of these specialties will appear in our next issue.



The C. P. Goerz Optical Works, of New York, have opened branch houses in Chicago (Hayworth Bldg). and in San Francisco (106 Union Square Ave.) to meet the growing demand for their anastigmats and specialties. The New York office is in charge of Mr. A. K. Bour-sault, the well-known photographic expert. The general management of the firm in America, however, remains, as before, in the hands of Mr. L. J. R. Holst.



Death has been busy among photographic workers during the past few months. We record with sorrow the loss of Charles S. Abbott, president of the American Aristotype Company, who died at Enfield, N. C., March 1; of Edward Wuestner, manufacturer of dry-plates, who died March 9; and of Edward W. Newcomb, editor of *The Photo-American*, who died at Stamford, Conn., March 29. *Requiescant in pace.*

Laboratory Notes

Under this heading will be published from time to time notes dealing with special points or difficulties from the chemist's point of view.

SODIUM PHOSPHATE

Occasionally we come across a developing formula calling for sodium phosphate. The natural thing to do is to go to the druggist or chemical dealer, and ask for that chemical. But, unfortunately, the ordinary "sodium phosphate" of the trade is not the sodium phosphate which is useful in developers. There are three phosphates of soda well known to chemists. They are :

Monosodium phosphate.

Disodium phosphate.

Trisodium phosphate.

The first need not concern us. The second, *disodium phosphate*, is the ordinary sodium phosphate or phosphate of soda of the trade. The third, *trisodium phosphate*, is the chemical which is sometimes used in developers, and, as it is not readily obtainable, it must usually be made when required. Fortunately, it is readily prepared from the ordinary phosphate by adding the proper proportion of caustic soda to the former. Now, pure caustic soda comes in sticks and, moreover, it quickly melts and deteriorates on exposure to the air, so that, to avoid the trouble of weighing off a definite quantity of caustic soda, we will simply start with an entire stick of the caustic soda, which can be quickly weighed ; and add the phosphate and water in proportion. Then proceed as follows: Weigh a stick of caustic soda and put it in a wide-mouth corked bottle. Add of ordinary sodium phosphate nine times the

weight of caustic soda. Cover the chemicals with water, so much being added that the water stands one or two inches over the crystals and set in a warm place, stirring occasionally until all is dissolved. If the chemicals do not dissolve in a reasonable length of time, more water must be added. Keep the bottle tightly corked while preparing the solution, as well as thereafter. When solution is complete, water is added to make 100 times as much of the solution as the quantity of caustic soda used. This will reduce the solution to a strength of 10 per cent, and it is then ready for use. If the solution should be turbid it may be filtered, but this is unnecessary, as the turbidity will quickly subside, when the clear portion may be poured off for use as required.

To illustrate the proportions by quantities actually used in one case :

Weight of one stick of caustic soda equals 6.4 grams.
 Sodium phosphate added 6.4×9 equals . . 57.6 grams.
 Total amount of 10% solution, 6.4×100 equals 640
 cubic centimeters.

of, if apothecaries' weight must be used :

Caustic soda . . . 99 grains equals 1 dram, 39 grains.
 Sodium phosphate 890 grains equals 1 oz. 6 drams 50
 grains.
 Total amount of 10% solution, 9,900 minims equals
 20 ozs. 5 drams.

One cannot but admire the greater simplicity and clearness of the metric system even in these simple calculations.

ERNEST A. TURNER.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

DECEMBER, 1904

Number 69

Printing-out Papers

Ever since the first appearance of THE PHOTO-MINIATURE there has been a steady demand for a monograph dealing with the manipulation of printing-out papers such as Aristo, Solio, Ilford P. O. P., etc. Since, however, success with these papers depends chiefly, if not wholly, upon the careful following of the instructions given with every package by the manufacturers, we felt that there was no necessity for a separate manual, which could, at best, deal with the subject only in a general way. The persistence of the request for a monograph on printing-out papers indicates that we were mistaken in our opinion, and that photographers will welcome a simply written account of the different kinds of printing-out papers and their manipulation. We are fortunate in being able to offer such an account, written by one who is thoroughly familiar with the manufacture, as well as the successful manipulation, of all classes of printing-out papers. The reader who absorbs the information given by Mr. T. Thorne Baker in the following pages, and gives intelligent care to the needs of the particular printing-out paper he may be using, should find no difficulty in securing the best possible prints his negatives will yield.—EDITOR.

The wonderful varieties of printing methods which have made their appearance during the last ten years have detracted very little from the fascination of what is familiarly termed P. O. P., or printing-out paper; and so great are the possibilities of both the gelatino-chloride

and the collodio-chloride processes that a monograph devoted to the printing-out papers will, I think, prove of value and interest to the majority of photographic workers. The advantage of obtaining a visible image during the printing makes a paper of this sort more valuable than any other kind for making rough proofs of negatives, and the further convenience of being able to work the paper throughout in daylight renders it of especial service in a great many cases. Add to this the power one has of producing a wide range of tones or "tints" for the final pictures, and we have a series of printing papers to which it is well worth our while to devote a little study.

It will be interesting to look, first of all, into the history of printing-out papers. The reader is probably aware, for example, that their immediate predecessor was the albumenized process, in which albumen, or white of egg, was "salted" and coated upon paper, the salted albumen paper when dry being "sensitized" by flotation upon a bath of silver nitrate. This involved a double process, the salting and the sensitizing, and the keeping qualities of the paper after sensitizing were far from ideal. The introduction, therefore, of a method combining both operations, by giving the raw paper one coating of a mixture of salts and silver emulsified in gelatine, showed marked progress, which was eventually followed up by the application of the same method with collodion instead of gelatine as the vehicle.

In the earliest days of photography it was known that chloride of silver became violet-colored on exposure to light, and that any organic material, such as paper, also became discolored in light if soaked in a solution of silver nitrate. The dry plate is prepared with silver bromide, as is also bromide paper, and if we examine either after exposure we can see no signs of any image. Hence advantage is taken of the chloride of silver as it becomes *visibly* discolored on exposure to light, and, in order to produce a vigorous picture, use is further made of auxiliaries, such as silver nitrate, citrate, tartrate, oxalate, etc., as will be explained more fully later on.

"Photo-chlorides" The name of Carey Lea is associated with the historical aspect of chloride of silver, as he carried out very numerous experiments with it, and termed his discolored salts "photochlorides." The exact action of light on silver chloride is not known, but it is generally assumed that the chemical energy of the sun's rays sets free chlorine, so that a photochloride is a partially decomposed silver compound which consists, anyway, of more silver than chlorine. You may, perhaps, ask why a P. O. P. image is violet, or even bronze-black if printed deeply enough, when metallic silver is distinctly known to be a *white* metal. This is easily explained, as the majority of metals familiar to us are all black in the finely divided state caused by chemical reduction.

The Earliest Suggestions The first crude printing-out papers were probably suggested by Sir H. Davy, in 1839, and "perfected" by Fox Talbot. According to Thornthwaite's *Guide to Photography* (1845), the paper was pasted down on a piece of wood and first brushed over with a solution of silver nitrate; when dry it was again brushed over with a solution of "muriate of ammonia." The paper thus produced was called "photogenic" paper. Hardwich's name is later on associated with a similar, but of course improved, method of preparing "salted paper," in 1856 or thereabouts.

G. Wharton Simpson Collodio-chloride emulsion was made by G. Wharton Simpson, in 1865, but his results cannot have been very satisfactory, most likely owing to the difficulties of coating paper with collodion.*

Twelve years later, in 1879, we hear of the first attempts to produce matte surface papers, by adding starch to the emulsion, and though Prestwich patented this addition fifteen years afterward, a good many makers use it at the present day.

The First Aristo The first commercial printing-out paper, i. e., the first put on the market, was apparently prepared by Obernetter

* We have examples of these made by Mr. Simpson, as fresh and brilliant as when they came to this country in 1865.—EDITOR.

in 1884. It was a gelatino-chloride paper, similar in character to those we have today, e. g., Solio, and was called Aristo paper, being the first to bear this now famous name. In 1885 Barker suggested a formula for the making of print-out papers, the publication of which set many experimenters and inventors to work. During the next few years the press teemed with formulæ and experiments, so that in 1890 there were many printing-out papers in the market, and the popularity of this class of papers—both gelatino- and collodio-chloride—was practically assured.

About this time a new collodion paper was introduced in America with the name of American Aristo, destined to be the forerunner of innumerable varieties of printing-out papers, most of which flourished for a year or two and are now forgotten. Undoubtedly American Aristo and its later varieties, Aristo-Platino, Aristo-Carbon, Aristo Junior, Aristo-Self-toning, etc., are the most generally used printing-out papers at the present time. They are all collodio-chloride papers, glossy and matt. Their manipulation is so fully covered in the excellent *Manual* provided by the manufacturers, that it would be folly to enter into details of their manipulation here.

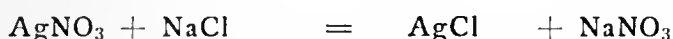
The first gelatino-chloride paper that Ilford P. O. P. caused any stir in the European world was Ilford P. O. P., introduced in 1891 by the Britannia Works Co. To their utilization of the initials P. O. P. as an advertising device, is due the now universal use of this simple appellation as a generic title for all gelatine print-out papers.

After the successful introduction of Aristo and P. O. P. in America and England respectively, it was not long before the photographic worker was positively burdened with the abundance of varieties of printing-out papers. For some reason or other, possibly climatic influences, collodio-chloride papers have always been most widely favored in America, while in Great Britain and on the Continent gelatino-chloride is most popular. Fortunately for the photographer, both sorts of print-out papers can be treated very much alike as far as general manipulation is concerned. Of course there are important differ-

ences in the handling of gelatine as compared with collodion papers, but these will be explained as we come to them.

The Chemical Side Let us now look briefly at the chemical side of the printing-out *process*, and see how one is enabled to get the initial print and final toned picture. Silver chloride, as we know, becomes violet on exposure to light, and it forms the basis of the emulsion with which P. O. P. is coated. But, as we well know, a printed-out image is reddish violet in color, and much more vigorous than one could expect from the chloride alone.

Take two test-tubes, and put a little salt and distilled water in one, and a crystal of silver nitrate and some distilled water in the other. When both are dissolved, mix the two. A white precipitate of silver chloride is formed thus:—



Silver nitrate + Sodium chloride gives Silver chloride + Sodium nitrate.
(salt)

Leave the test-tube until the white mass has settled, then pour off the clear liquid, and spread the white silver chloride with a knife on a piece of paper and expose it to light. It will turn violet, and no more. But now repeat the experiment, this time moistening the white precipitate on the paper with a little silver nitrate solution, and you will find that on exposure to light it will turn quite deep brown. We learn from this simple experiment that by having an *excess* of silver nitrate present in the paper, a rich chocolate-colored image can be obtained by light action.

The P. O. P. Emulsion The P. O. P. emulsion, therefore, consists of the following things. First, the chloride of silver, incorporated with, or emulsified with, a "carrier" such as gelatine or collodion. Second, a vigor-producer,—silver nitrate,—which acts as a store from which fresh silver can be obtained during the building up of the image in printing. Third, an organic salt of silver, such as the citrate or tartrate, which gives body to the image and prevents it from dissolving out too much during toning. Lastly,

the preservative, which is almost invariably pure citric acid.

It must be understood that the milk-white salts in the emulsion have to be decomposed by light to give us an image of either metallic silver or some partially reduced silver salt. Thus, to put it very crudely, we might say that—the paper is coated with:

Silver salts, and the color is *white*. While it is being printed these silver salts become *Silver sub-salts*, and the color is *violet to pink*. When over-printed, we get actually *metallic silver*, and the color becomes *bronze*. The shadows in a P. O. P. print often appear “bronzed” if too deeply printed; a good P. O. P. will never become bronzed in the shadows *unless* very much over-printed or with an underexposed negative.

Excess of Free Silver By making a gelatinous solution containing the salts, or by dissolving them in collodion, and then adding the silver nitrate in solution to this, we get a precipitate formed of the sensitive salts, each particle of which is instantly surrounded by gelatine or collodion respectively. The smaller these particles are, the richer will be the image. The greater excess of silver nitrate present in the emulsion, the more violet-colored will the paper print out, and the more gold will it require in toning. Tap water always contains chlorides in it, and consequently when we wash the prints in tap water previous to toning, we find that it becomes milky owing to the chlorides combining with this free nitrate of silver to form white silver chloride. Hence prints are always washed before toning until the wash-water shows no signs of milkiness, i. e., until all excess of free silver nitrate is removed. If you want to save your gold in toning, be careful to make a note of this.

What Happens in Toning Assuming that the P. O. P. print, when sufficiently printed out, consists of an image more or less of metallic silver imbedded in the gelatine, we may now briefly consider the question of toning, and see what actually takes place. The printed-out paper is washed until all free nitrate is removed from the film; it is then put into a toning bath, and gradually it becomes changed in ap-

pearance. If the toner be made with gold,—as the majority of solutions are,—tiny particles of metallic gold separate out of the bath by electrical action, and become deposited as an extremely thin film upon the reduced silver image. Toning is, therefore, an electroplating process, in which the silver image becomes actually coated with gold, and this gold film is so thin that the image appears of a purple-red color. In a similar way we could tone a P. O. P. print with platinum, tin, lead, etc., but of such metals as have been put to the test gold and platinum alone are of any lasting value.

As soon as the print has been sufficiently toned, it is put into water to wash for a few minutes, and the pores of the paper and the film itself being impregnated with toning solution, the action is apt to go on during this washing. It is for this reason that Eastman advises using a “short stop” bath, i. e., a slightly acid solution, or a solution of salt, which instantly stops the toning from proceeding any further. In this detail follow carefully the instructions given for the paper in use. Putting the prints straight from the toning-bath into the fixing solution is never advisable, as the whites are liable to become discolored, the toning proceeds, and sometimes the toning salts react with the fixing-bath and start sulphurizing action.

The Action of the Fixing-bath The print is left in the fixing-bath for ten to fifteen minutes, during which time the hypo,—or sodium thiosulphate,—converts all the white silver chloride and other unreduced silver compounds remaining in the film into a soluble product,—silver-sodium thiosulphate. Consequently in a few minutes all that remains imbedded in the gelatine or collodion film is the gold-plated silver picture.

Importance of Washing Fixing done, the print has next to be washed, and with P. O. P. washing is one of the most important items, and must be carefully carried out. The pores of the paper are saturated now with hypo solution, and possibly some by-products of the toning bath. Gelatine papers are worse in this respect than collodion, for the gelatine film swells

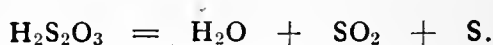
during the manipulation and soaks up the various solutions in turn, so that after fixing we have to rid both film and paper support of deleterious compounds. Ten or twelve changes of water, each one allowed five minutes for action, will, in general, thoroughly wash the prints, as hypo is extremely soluble in water. But far preferable is the use of running water, the prints being kept separate during the whole time. An hour to ninety minutes is usually allowed for washing, irrespective of the method employed.

Hardening Baths

We must not leave the chemical side of the subject without considering another point or two. The first is the alum or hardening bath, which is more frequently used by American than by English workers, as the former have, on the whole, a warmer climate. Alum, either as chrome or potash alum, hardens the gelatine film, and the contraction thus caused prevents the film from frilling or blistering. The alum bath can be used between toning and fixing, or the alum may be used with the fixing-bath itself. This paragraph refers to gelatine papers only, with the exception of collodio-carbon paper.

Combined Baths

The second is the combined toning and fixing-bath, in favor of and against which so much has been said and written. It is quite possible that the combined bath is a safe one and yields permanent results if carefully handled; but the mere fact that an old bath works better than a fresh one is in itself suspicious, and the lamentable results that one sees from time to time, which are directly traceable to the use of it, makes one very chary of taking it up. It seems quite possible for toning to take place side by side with fixing, and as long as our combined bath consists of gold and hypo only, not much danger seems likely, but the use of baths containing lead and alum should certainly be avoided if permanent results are desired. To begin with, the citric acid present in the P. O. P. reacts with the alum and liberates thiosulphuric acid—an acid which eventually splits up into water, sulphur dioxide and sulphur:—



Sulphuretted hydrogen is also evolved, as one would guess by smelling the bottle containing a combined bath, and *this* reacts with thiosulphuric acid products and causes the formation of sulphur once more. Toning, in fact, takes place as likely as not with the combined bath, owing to this liberation of sulphur, and the danger of sulphur toning is that we may get it in the whites of the picture, with the result that a visible sulphide of silver, or yellowish green stain in plain language, eventually makes its appearance.

Do not think, however, that I wish to condemn the combined bath altogether. Much of our photography is of a somewhat ephemeral nature, and for rapid work and convenience it takes a lot of beating. Only where permanence is an essential,—don't use it. On another page, the most reliable formulæ will be given for the convenience of the reader.

Home-Made Paper

Those who wish to try their hand at making their own printing-out paper,—and it is a decided advantage to know how to do so,—will find that the so-called salted paper is the easiest, and its preparation makes a good starting point. Any good ordinary paper may be chosen, such as fairly smooth drawing paper or even writing paper. The paper is first coated with a mixture of gelatine and the salts necessary to produce the sensitive compounds of silver when sensitized. Thus a solution should be prepared as follows: Soft gelatine, $\frac{1}{2}$ ounce; distilled water, 7 ounces; sodium chloride (cooking salt), 60 grains; citric acid, 120 grains.

Preparing the Salting Solution

The salt and acid are first dissolved in the water, and then the gelatine is added, and the whole stirred and gradually heated up to about 40°C (105°Fahr.) until complete solution has taken place. It is a good plan to put the ingredients into a glass beaker, which may be stood in a larger vessel (or water bath) filled with hot water. When all the gelatine is dissolved, the solution must be strained or filtered through two thicknesses of muslin; the muslin should be well washed first, and not used *new*, in which state it contains chemical dressings. The filtration frees the

solution from the small insoluble particles of gelatine which otherwise would cause spots in the paper.

Coating the Paper The filtered mixture is now poured into a clean porcelain dish, large enough to take the paper to be coated; a sheet of paper is allowed to float on the surface for three minutes, after which time it is taken up, by one corner, drained, and pinned up to dry. It is quite insensitive in this state. When laying a sheet of paper on the salting solution, it should be taken up by one hand at each end, and bent into a curve (as Fig. 1); the convex edge touches the liquid first, and the two sides are then lowered until the whole sheet rests on the surface of the solution, *free from air bubbles*. If, on drying, the paper appears too glossy, the temperature of the salting bath was too low, and vice versa; this detail being wholly under control.



FIG. 1

Sensitizing The salted paper as made above will keep indefinitely, but must be sensitized the day before use by a further floating, this time for two minutes on a *sensitizing bath* made up as follows:

Silver nitrate, 150 grains; distilled water, 4 ounces. This quantity of solution should suffice for about fifty sheets, half-plate or 4 x 5 size, but if not exhausted all at once, it should be kept in a bottle well corked and away from the light. After a couple of minutes floating on this bath, each sheet of paper is pinned up, in a dark-room this time, and when dry may be used just like ordinary P. O. P.

A Gelatine Emulsion Paper We next come to a more interesting problem, the manufacture of gelatino-chloride P. O. P., and, in order to enable the reader to make a little for himself, I shall very briefly describe its preparation on a small scale. Two solutions should be made up as follows: A. Silver nitrate, 120 grains; citric acid, 60 grains; distilled water, 2 ounces. B. Gelatine (hard), 1

ounce; sodium chloride, 15 grains; potassium citrate, 18 grains; water, 8 ounces.

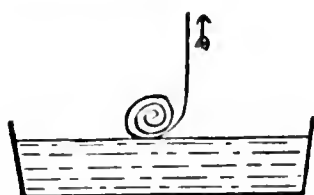
Solution *B* should be prepared by first adding the chloride and citrate to the water, and then the gelatine; the mixture is then warmed up to 40° Centigrade (104° Fahr.), being stirred well until all the gelatine has dissolved. The *A* solution, which is better to be cold, is then slowly poured into *B*, in a fine stream, accompanied by vigorous stirring of *B* with a strip of glass. A dram of alcohol is then stirred in, and if desired ten grains of alum dissolved in a little water can also be added to harden the emulsion. The whole is then strained through muslin, and may be used at once for coating the paper.

Baryta Coated Papers Commercial P. O. P. is made by coating such an emulsion as above described on specially prepared paper; the glossy P. O. P. emulsion is coated on a raw paper already glossy in surface, owing to a coating of gelatine and baryta, which in the cases of "pink" and "mauve" P. O. P. is dyed slightly pink or mauve, respectively. Any ordinary good quality dull-surfaced paper can be made into "baryta paper" by floating it for a couple of minutes on an emulsion made by mixing the two following solutions: *A*. Barium chloride, 120 grains; water, 4 ounces. *B*. Gelatine, ½ ounce; sodium sulphate, 80 grains; water 4 ounces. Heat *A* and *B* to 40° C. (105° Fahr.) and then emulsify them together just as in the case of the sensitive silver emulsion. The paper is fairly thickly coated with this, drained, and pinned up to dry, after which it may be used for coating with gelatino-chloride or collodio-chloride emulsion.

Note Do not think that for experimental purposes it is necessary to use baryta paper for coating. Any paper will answer, only the risk has always to be run that some impurity in it will cause spots or discoloration. Gelatino-chloride emulsion must be made and coated in gaslight, but yellow or ruby light is not at all necessary; the paper is best dried in the dark, and, once dry, should be cut up into sizes and wrapped up in waxed tissue and brown paper.

About Coating Papers

Before proceeding to describe the preparation of collodio-chloride P. O. P., I will explain a method by which fairly large quantities of paper may be coated in a few minutes, thus avoiding the tedious process of floating small sizes on the hot emulsion in a dish. Cut the paper to be coated into strips a little narrower than the long side of the dish used for the emulsion, and about three feet in length. Thus, if we use a half plate dish, cut the paper into strips three feet by six inches wide, and roll these up with the side to be coated *outward*. Now fill the dish with the warm emulsion, and stand it in a bigger dish filled with warm water (to prevent the emulsion from setting); lay one of the rolls of paper on the surface (Fig. 2) and take hold of the end, and pull gently upwards;—the paper gradually un-



The roll of paper on the emulsion

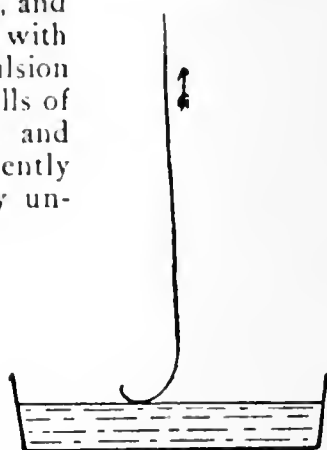


FIG. 2

The coated strip, unrolled, leaving the emulsion

rolls, and as it does so becomes coated with emulsion and as soon as it has been completely unrolled it may be pinned up to dry in a warm room. Remember that the quicker you unroll the paper, i. e., the quicker you pull the end upwards, the more thickly does the paper become coated, and the richer will it be in printing. The coating can be made thicker or thinner by having the emulsion colder or hotter, respectively, about 95° Fahr. being about the best for the P. O. P. formula given. Half a dozen strips can thus be coated in a few minutes, and when these are dry and cut up they make a nice lot of paper for experimenting [with]. Paper so prepared can be depended upon to give satisfactory results.

**A Collodion
Emulsion
Paper**

Lastly, we must look into the manufacture of collodio-chloride emulsion, which is much easier to make—owing to it all being done at the ordinary temperature,—though rather more difficult to coat. A small supply of gun-cotton or pyroxylin, or, better still, an ounce of Schering's "celloidin," will be required, and a few ounces each of alcohol (rectified spirit), and ether (s. g. 720). We cannot, of course, use ammonium or sodium salts in this case, as everything we use must be as soluble as possible in alcohol and ether; only the least possible quantity of distilled water must be employed.

Two solutions have to be prepared, and subsequently emulsified together. The first is made up as follows: *A*. Silver nitrate, 85 grains; distilled water, 1 dram; alcohol, 3 ounces; pyroxylin, 1 dram; ether, 3 ounces.

The second solution contains the salts, and is: *B*. Lithium chloride, 10 grains; citric acid, 10 grains; pyroxylin, 50 grains; alcohol and ether *each*, 5 ounces. In both *A* and *B* the gun-cotton must be first dissolved in the alcohol and ether (mixed), and then the salts added, and well shaken up until quite dissolved. *B* is now put into a clean, dry 20-ounce bottle, and bit by bit *A* is added to it, a vigorous shaking being given the bottle between each addition. A creamy emulsion is thus formed which is ready immediately for coating the paper if desired. Keep this from the light.

**Sizing the
Paper Stock**

If baryta-paper be not at hand, any good sort of paper can be used, but it must first be given a "sizing" or coating of gelatine. This may be done by using a solution of soft gelatine $\frac{1}{2}$ ounce, water 20 ounces, with which the paper is coated by flotation or the roll method above described, as may be most convenient.

**Coating the
Paper**

In order to coat paper with collodion emulsion, a piece of glass instead of a negative should be placed in a printing-frame, and over this a piece of paper—slightly larger than the glass—is stretched, and then the back of the frame is fastened in. A pool of emulsion is poured on to the center of the paper, and the frame tilted in all

directions until completely covered; the surplus emulsion is then poured off, the frame undone and the paper removed and hung up to dry in a cool room. Another way is to lay the paper on a piece of glass, and keep it flat by means of the fingers while the emulsion is poured on and distributed over it. The whole thing needs to be rapidly and smartly done in order to get a nice coating, but at the best of times hand-coated collodio-chloride P. O. P. can only be regarded as experimental.

We now come to the practical working of printing-out papers, and I shall endeavor to point out in the following pages the most successful ways and methods of using the many commercial papers on the market, both collodion and gelatine.

**Manipulation
of Print-out
Papers**

Eastman's Solio paper is a very good sample of the ordinary gelatino-chloride P.O.P., and those brands already mentioned with this name must be looked upon as a whole, to be, in general, treated alike. Collodio-chloride papers, such as Aristo, Eastman's, etc., etc., may be at present classed with the gelatine papers, at least as far as the preliminary remarks are concerned. In the after manipulations they require very different handling.

**Storage and
Handling**

All printing-out papers should be kept in a fairly cool place, and if much be kept at a time, in a room not subject to great variations in temperature. It must be remembered that a packet, once opened, should be used up as quickly as possible; also that, although printing-out papers can be handled in daylight, they must be treated with reasonable respect, and not exposed carelessly even to subdued daylight. Do not complain to the makers because you find the paper a little off color; consider first whether you have treated it with the reasonable care it requires in this respect.

**Light for
Printing**

Gelatine and collodion papers are capable of giving finer detail than the older albumenized papers, for the reason that the former are coated on paper which has a preliminary substratum, so that the emulsion is all on the surface, and does not sink into the pores of the paper.

In order, however, to get the full advantage of the paper, it must be printed in a suitable light, i. e., a soft or diffused light. Printing in the shade will give the pluckiest results, whilst strong sunlight is apt to give soft prints. We therefore have a double means of control in printing; for we can obtain a vigorous or a soft print from the same negative by using weak light or sunlight respectively, or we can use sunlight for harsh negatives and subdued light for flat negatives. The scale of gradation obtainable is perhaps best of all when one employs a room lighted in the roof by a glass skylight, the glass being pasted over with two thicknesses of tissue paper, and the frames laid on a table directly underneath. A north light is desirable otherwise, as there being no direct sunlight from this direction, the frames can be placed in a vertical position on a series of racks or ledges.

Let us consider for a moment what **The Negative** class of negative is best for printing-out papers. It is almost a maxim that a pyro-developed plate, the film of which is slightly brown through staining, is the best of all. But if our negatives are heterogeneous, some thin, some contrasty, it is a wise plan to print the thinner ones with printing-out papers, and to reserve the over-harsh ones for bromide, platinum or carbon printing. Sometimes the sky in a negative is too weak, and prints out gray instead of white, and in many underexposed and underdeveloped negatives one finds that the shadow portions appear much too dark in the print. This can be remedied by painting over such parts on the glass (or celluloid) side with either yellow or pink varnish. A thin solution of collodion, or a hot solution of gelatine, may be dyed with a trace of carmine or aurantia, and brushed over the glass so as to weaken the action of the light in the parts in question. Another method is to stick tissue paper over the weak parts, of course on the glass side again; only here one is apt to get a sharp line in the print corresponding to where the paper leaves off or begins.

Pinholes, bubbles, etc., in the negative should be spotted out with a fine camel's-hair brush and some carmine or burnt sienna, as black spots look very objec-

tionable in a P. O. P. print. An effective picture can sometimes be obtained by entirely blocking out the background in a portrait; this is done by painting it out on the film with one of the opaque varnishes or media on the market. I always advise varnishing the negative well before printing in P. O. P. if any number of prints are required, as the film of a dry plate is hygroscopic, and if damp often turns the paper a bad color during the printing, and moreover, a great deal of P. O. P. printing will sometimes stain the film of the negative itself—especially in wet weather.

How Far to Print Both gelatino- and collodio-chloride papers should be printed deeper than the finished picture is wanted, as both in toning and fixing some of the density is lost. It may be taken as a general rule that those papers which print out very violet or blue in color should be carried further in printing than papers which give a reddish image. If during the printing it is seen that the negative is so thin that a very flat image is coming, pin two thicknesses of tissue paper over the front of the frame to soften the light. When examining the paper during printing, never open the frame in the strong light; take it first into an inner room, or at any rate some distance from the window. Even a second's exposure to *direct* daylight is sufficient to ruin the whites of a piece of printing-out paper, thus rendering the resulting print flat.

Tinted Papers Many years ago, when commissioned to buy a packet of P. O. P. for a friend, I was told on no account to get pink or mauve, but only white. On asking the reason why, the photographer in question said that any P. O. P. that had been slightly exposed or was "off color" was packed by the makers as pink or mauve, according to the degree of discoloration. This was, of course, an absurd fallacy! Pink P. O. P., and mauve similarly, is paper in which the substratum is dyed very slightly, so that when the emulsion is coated upon it, the tint shows through. Mauve paper is extremely popular, as slightly veiled "whites" show less with it than with white, and any discoloration from toning or undue exposure to light,—by the photographer,—is less accentuated.

**More About
Printing
Depth**

When printing self-toning papers, the depth of the image has some influence on the final tone of the picture. Thus supposing the paper to contain gold, it is well known that a dark picture will require more gold to tone it than a light one; hence, in order to obtain a well-toned print with such papers, do not allow the printing to proceed too far.

Aristo self-toning paper and the Paget paper of the same class are good examples of papers of this class which, with simple treatment, yield nicely toned pictures, and these we shall consider more carefully in the proper place.

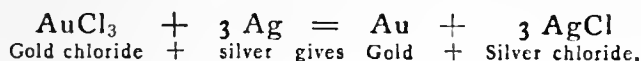
Certain special kinds of paper require very deep printing, as a good deal is either lost in the fixing, or else through special treatment necessary in toning. Salted paper, for example, loses a great deal in fixing, whilst Aristo-Platino paper, owing to the compound toning process, similarly requires printing until the deep shadows are well bronzed.

**Toning
Gelatine
Papers**

Let us now assume that we have a few pieces of paper printed out, on gelatino-chloride P. O. P., of the Solio or Ilford P. O. P. type—I quote these two names as being pretty widely known to my readers. Practically, the whole success of P. O. P. printing rests with the toning, and we shall, therefore, first look into the simplest and surest method of procedure, considering the more esthetic and out-of-the-way methods later on.

**The Gold
Bath**

Toning, as has already been pointed out, is very much the same as electroplating. The salt of gold we buy from the dealer, or which can be made by dissolving gold metal in a mixture of one part of nitric, and three parts of hydrochloric acid,—consists of gold and chlorine in the proportion of one to three. Gold chloride, or gold trichloride technically, has the chemical formula AuCl_3 , and the reason we add to a solution of this salt a secondary reagent such as borax or bicarbonate of soda will be seen from the following. With gold trichloride the silver of the P. O. P. image is used up threefold:



But gold *monochloride*, AuCl , requires only one part of silver, comparatively, and thus saves our image :



How do we get AuCl , the monochloride of gold ? Well, this is done simply by neutralizing the gold chloride solution with an alkaline salt, such as borax, sodium phosphate, or sodium bicarbonate. The successful toner wants the following things in his workroom : A bottle of 10 per cent ammonia solution, an ounce of borax or sodium bicarbonate, a tube of gold chloride, distilled water by preference, and two books of litmus papers,—red and blue. It must be remembered that an alkaline bath tones quickly, readily and surely, and for all-round work one cannot do better than stick to it. The 15-grain tube of gold may be dissolved in 15 drams or 15 cc. of distilled water, and a dram or cubic centimeter, respectively, taken whenever a grain is wanted. To make the toning-bath, add a grain of "gold," i. e., its equivalent in solution, to an ounce of water. Test it with litmus paper; it will turn blue litmus paper red, or, in other words, it is acid. Now add a saturated solution of borax (or sodium bicarbonate, etc.), or even the powdered salt itself, to the solution, stirring it with a glass rod, until on testing with litmus paper it is found to be very slightly alkaline, so that it just turns the red paper a lilac-blue color. Now dilute the ounce to 40 ounces, or 48 ounces even, with water, and the toning-bath is ready.

A more rough-and-ready way is to add one grain of gold to 40 ounces of water, and stir in seven or eight grains of sodium bicarbonate (the exact quantity is not of great consequence).

When Sulpho- The makers of Paget, Ilford, Barnet,
cyanide Is Gem and other English brands of P. O. P.
Used almost invariably recommend the sulphocyanide bath, to be used rather stronger in gold than that just described. Thus two grains of gold chloride are dissolved in sixteen to twenty ounces of water, and thirty grains of ammonium sulphocyanide are added.

Toning Capacity of Gold Whatever be the strength of the toner as regards gold, certain it is that a grain of gold chloride can only be expected to properly tone a certain area of paper,—a definite number of prints. Thus one grain of gold should comfortably tone twelve half-plate or 5 x 7 prints. It is obvious that if you prefer reddish tones to colder ones, the gold will go further, and vice versa. A sheet of P. O. P. 24 ½ x 17 inches requires on the average 1 ½ grains of gold chloride for toning. The following little table should prove of practical use to those whose custom it is to tone a dozen prints at a time.

Size of Prints:— (Inches)			Grains of Gold Chloride necessary on the average:—
	2 ¼ × 3 ¼		¼ grain
(¼-pl.)	3 ¼ × 4 ¼		½ grain
	4 × 5		¾ grain
(Cab.)	4 ¼ × 6		5/8 grain
(½-pl.)	4 ¾ × 6 ½		1 grain
	5 × 7		1 ⅙ grains
(⅓-pl.)	6 ½ × 8 ½		1 ⅔ grains
	8 × 10		2 ½ grains
	10 × 12		4 grains
	12 × 15		6 grains

Preliminary Washing A preliminary washing must be given to the prints before toning. This is in order to free the film from citric acid and free silver nitrate. A good deal depends on this first washing, and, in order to ensure good results, it is necessary to keep the prints constantly moving in the water, so that they do not stick together. If running water is not at hand, six or eight changes of clean water must be given, each of about one minute's duration. Care should be taken not to touch the surface of the prints with the fingers; take hold of a P. O. P. print always by one corner, and that a small one! These details need particular attention in warm weather, when the fingers are liable to be moist from perspiration.

The Toning Process

Supposing about half a dozen prints to be toned, a dish about double the size may be used for the operation, and enough toning solution for the lot put in it. Thus for toning six cabinet prints on Solio paper, for example, we should require twenty ounces of solution containing one-half grain of gold chloride; this might be put into a $6\frac{1}{2} \times 8\frac{1}{2}$ tray, and one by one the prints taken from the wash-water and placed in the toner. When all the prints to be toned are in the dish, they should be constantly turned over and over, the dish itself being gently rocked. If we desire a variety of tones, so that some prints require longer than others, each one as it is done should be removed from the dish and placed in an *intermediate bath*, which will stop toning instantly. A very weak solution of sodium sulphite,—say five grains to the ounce,—will answer this purpose, or we may use the short stop bath recommended by the manufacturers of the paper we are using.

The Fixing Bath

It is "plain sailing" when all the prints take about the same length of time in the toning bath, as they can then be well washed in several changes of water when finished, and then immersed, one by one, in the fixing solution. This is made up of hypo and water, the average strength being about two ounces to the pint. A stronger bath is unnecessary with any commercial paper.

Double Toning

There are a variety of printing-out papers on the market which are amenable to double treatment, first with gold, then with a second metal such as platinum or palladium. I mention this now, as any toning operations must be carried out before using the alum hardening bath. Alum is, of course, used in order to harden the film of a *gelatine* paper, but many papers are now so treated in manufacture that frilling and softening of the film do not occur. Thus the Tropical Solio P. O. P. is one example, whilst collodion papers give very little trouble in this respect, except when coated on paper with a substratum.

I have obtained some very charming tones on the Aristo Platino paper, and as the treatment its makers recommend is suitable for obtaining fine results on

matt gelatino- and collodio-chloride papers in general, it will be interesting to enumerate a few practical details. The preliminary wash is given in the usual way, but it is to be noted that the Aristo paper is inclined to curl slightly, and has to be coaxed out with the fingers in order to make it lie flat.

In order to carry out the double procedure, a first toning is given with an alkaline gold bath, until a warmish purple color has been affected by the image. Aristo, by-the-way, loses rather in toning, and the secret of success with it is to print very deeply, and not to be disconcerted in this instance by bronzed shadows, which all disappear eventually. The gold-toned prints are now washed for a few minutes, and then treated to a second toning in a platinum bath. For Aristo papers the reader is strongly urged to employ the platinum solution prepared by the makers as best suited to success with their products, but for other papers I have generally used the platinum toner recommended many years ago by Liesegang, which consists of: Water, 8 ounces; nitric acid, 4 drops; chloroplatinite of potassium, 1 grain.

The platinum toner recommended for Kodak Collodio-chloride P. O. P. (English) is as follows:

Potassium chloroplatinite, 4 grains; citric acid, 100 grains; water, 30 ounces.

The prints should be left in the platinum bath until a rich tone of the desired color has been obtained, after which they are well rinsed and placed in the hypo bath. Sometimes the whites of the picture will appear to go muddy, but no notice need be taken of this, as on longer immersion in the toner they become quite clear and brilliant again.

More About Collodion Papers

We will now leave the subject of gelatine papers and double toning methods, etc., and look into the subject of collodion papers a little more fully. In collodio-chloride paper we have a different class of papers to deal with as compared with gelatine papers. Thus the collodion film does not absorb water, whilst the paper support does, and hence many collodion papers have the tendency already noted of curling

inwards. I have heard complaints, too, of some papers having a tendency to break owing to the brittle nature of the collodion film, but this is not a thing of frequent occurrence. The curling may be overcome very simply in the way described in the *Aristo Manual* published by the Aristotype Company. A clean dish is filled up half an inch deep with water, and the prints are placed in this, one at a time; as soon as one is thoroughly wet, another is slid on to it, and so on, each one partially but not entirely covering that underneath. When all the prints are in, pour off the water and fill up the dish with fresh, and keep the prints flat by pressure with the flat of the hand. Five or ten minutes' soaking in as many changes will flatten out as well as wash the prints, which can then be freely rinsed, and toned. It is very important to thoroughly wash collodio-chloride P. O. P. before toning, and to see that all milkiness disappears in the last-but-one wash-water.

Washing Before Toning It holds good in general to print fairly deeply with collodion papers, although there are, needless to say, exceptions. Thus I believe that the Monarch Matte paper requires only sufficient printing to bring the image to the apparently correct depth, as it does not fix out in the after manipulations. One advantage of no inconsiderable importance in collodion papers is that no toner is absorbed by the carrier of the sensitive salts; in other words, collodion will not "soak up" the toner, and hence the gold or platinum is deposited on the actual surface of the print, while there is little doubt that in gelatine papers some metal is precipitated within the colloidal substance.

Toning Toning with a gold bath made neutral or slightly alkaline with borax or sodium bicarbonate should take from five to eight minutes. If subsequent toning with platinum is to be given,—and I really think it pays to make a general practice of this,—let the prints become purple in the gold bath if black tones finally are required. Remember that the platinum tone is to a great extent controlled by the gold toning given. Some really fine sepia and chocolate tones, of probably absolute permanence, can be got

with about two minutes in the gold bath, and then from half to one minute in the platinum bath. I have obtained some excellent results with Kodak, Paget, Aristo and other similar papers by this treatment.

**The Short
Stop**

As soon as the desired gold tone has been arrived at, the prints should be immediately placed in the *stop bath*, which, for collodion prints, may be made very readily by putting an ounce of cooking salt in three pints of tap-water. Five minutes in this suffices, after which time the prints can be either platinum toned or fixed straightaway.

**The Harden-
ing Bath**

As regards alum,—and this applies equally to both collodion and gelatine papers,—the hardening bath may be used intermediately between toning and fixing, or the alum itself may be incorporated with the fixing-bath. Personally, I strongly recommend a separate hardening solution; alum and hypo very seldom go together without causing (i) the liberation of sulphuretted hydrogen and (ii) the precipitation of sulphur. A simple combined hardening and fixing solution may be made as follows:—Sodium thiosulphate (hypo), 1 pound; alum, 2 ounces; water, 1 gallon.

The reason we want a hardening bath with collodion papers requires mentioning, as I have said that collodion is insoluble in water. Most collodio-chloride P. O. P. is made on substratum- or baryta-paper, which, as was explained earlier, is raw paper coated with an insensitive emulsion of gelatine and barium sulphate. Hence, even in a collodion paper, we may have a *gelatine under layer* to deal with. In hot climates I have known this layer to melt away altogether, with the result that the collodion film peels right off the paper. But the instructions with the paper will guide the reader in this detail.

**Sulpho-
cyanide Baths**

Before leaving this part of the subject, brief mention of the sulphocyanide bath must be made, as it is so greatly in vogue with Imperial, Barnet, Paget, Wellington and Wards' Gem, and other English makes of printing-out papers, although rarely advised for American papers.

The sulphocyanide bath is an excellent toner, provided toning be not carried too far. Yellowish green

high-lights are apt to result from overtoning, and it must be borne in mind that when the prints appear to the eye to be sufficiently toned, they should be rinsed in water and placed in the fixing-bath; a good deal of the tone is thus lost, but only temporarily, as during the fixing, washing and drying the tone again becomes colder. Hence, do not allow anything, or at any rate only very little, for loss of color, and then you will find the sulphocyanide bath all that could be desired. The following formula is a reliable one: Water, 16 ounces; ammonium sulphocyanide, 30 grains; gold chloride, $2\frac{1}{2}$ grains.

This, as you will at once see, is much stronger than the gold baths already mentioned. But one grain of gold will tone the same number of prints as before,—no more, no less. Always keep your sulphocyanide bath alkaline; test with litmus paper and add a drop or two of ammonia if necessary. Always use the sulphocyanide bath *freshly* made up.

Uneven and Double Tones Double tones sometimes occur and are laid down to all sorts of causes, but the chief cause is an exhausted bath, which tones the high-lights and not the shadows. A less frequent cause is uneven coating in the paper, but this fault is practically overcome by the excellent coating machinery nowadays possessed by manufacturers. Double toning, however, never occurs with the combined toning- and fixing-bath, and hence this paragraph leads to the next.

The Combined Bath The combined toning- and fixing-bath may be aptly described as a snare set by the evil one for the photographer. In careful hands it works well and safely, and yields results which are in most cases fairly permanent. But one has only to smell the average combined bath to realize that sulphuretted hydrogen is present therein, and consequently one is liable to the precipitation of sulphur or some metallic sulphide in the film. I certainly think that, on the whole, combined toning and fixing is more applicable to collodion than to gelatine printing-out papers, as there is small chance of any form of precipitation in the collodion film. The chief thing to observe

in the use of the combined solution is that the final washing be carefully carried out. No previous washing is given to the prints, which should be considerably deeper than the finished picture is desired. The prints should be kept constantly moving in the solution, and an *auxiliary fixing-bath* should always be kept at hand so that if the desired tone is reached within ten minutes they can be at once removed, rinsed in clean water, and given another four or five minutes in this. The auxiliary fixing-bath is made by dissolving four ounces of hypo in twenty of water.

Nicol's The simplest and best combined ton-
Formula ing- and fixing-bath for gelatine papers
is that recommended for many years by
Dr. John Nicol, as follows: Sodium hyposulphite, 3
ounces; solution of gold (1 grain to the dram), 4
drams; water, 16 ounces.

Dissolve the hypo in the water and add the solution of gold.

Prints, over-printed to the usual extent, may be placed in such a bath direct from the printing-frame and toned to any desired shade up to a deep purple-brown or darker, depending largely, of course, on the density of the negative and depth of printing. With most samples of paper the print first assumes a pale, sickly yellow, then begins to turn darker and darker, finally reaching the darkest and richest that the amount of reduced silver will admit of, that depending, as we have already said, on the depth of printing of which the negative will admit, after which, if it is allowed to remain in the bath, it will enter the slatey blue stage, becoming weak and "mealy."

A reliable formula for a combined bath is that given by Vogel, as follows: Water, 35 ounces; hypo, 7 ounces; ammonium sulphocyanide, 7 drams; lead acetate, 67 grains; alum, 1 ounce; 1 per cent gold chloride solution, 2½ ounces.

Another good bath may be prepared as follows: Water, 10 ounces; hypo, 1 ounce; citric acid, 2 grains; alum, 20 grains; lead acetate, 7 grains; gold chloride, 1½ grains. But these contain lead salts and are open to the objections already mentioned on this score.

Self-toning Papers

Self-toning papers are now very plentiful, and as each maker gives the instructions which are specially applicable to his own paper, it is needless to enlarge on the subject here. Some self-toning papers require simply fixing in hypo, whilst other makes require preliminary treatment in order to "bring off" the tone. To my mind a self-toning paper is of little value unless by simple fixing it tones automatically, but at the same time a packet of any brand of self-toning P. O. P. should be kept handy in case at any time one runs out of gold. Whether every individual self-toning paper tones by means of gold I should not care to say; there is no doubt that with the combined bath much of the toning is due to the so-called "sulphur toning," because an old, used-up bath is invariably better than a fresh one. Similarly, if you give a self-toning paper a preliminary wash, you run the risk of washing the gold out of the film (unless present in the emulsion in the form of an insoluble salt), whilst if you simply fix it direct, immediately after printing, you have in the fixing solution, hypo, citric alum, probably alum, gold or no gold as the case may be, and in fact most of the constituents of a combined bath. I have made, experimentally, self-toning papers containing one-twentieth, one-tenth, one-fifth and one-third of a grain of gold, approximately, per 25 square inches, and each gave very much the same tone in the after-treatment. But then there is a right and a wrong way of making a self-toning paper.

Developing P. O. P.

Partially printed P. O. P. can be developed with a non-alkaline developer, but in this case it is wise to first wash the prints, and then immerse them in a 5 per cent solution of potassium bromide to convert any free silver nitrate into bromide. A solution of pyro or edinol 5 grains, potassium metabisulphite 5 grains, water 2 ounces, may be employed for the development, a few drops of ammonium carbonate solution being added to accelerate the action. When sufficiently developed, the prints are well rinsed, and then fixed or placed in a combined toning-and fixing-solution, this being preferable to separate baths after development.

The After Washing Washing is perhaps the most important process in the manipulation of P. O. P., though I fear I have only limited space in which to touch upon it. It is absolutely essential to rid the paper and the film from the last traces of hypo, as otherwise the prints are sure to fade sooner or later. The largest portion of hypo is removed from the film during the first few minutes, but it is the "remnants" which one finds such difficulty in removing. Prints which have been fixed in a fairly strong hypo bath, the self-toning papers and the heavier papers, i. e., P. O. P. made with thick stock, all require longer washing than under other circumstances.

An hour's washing in running water is generally sufficient with the thinner papers, provided the prints be kept separated. To ensure separation, those washers which keep the prints constantly turning over and over are invaluable. Where one washes several prints in a dish, however, running water should be used, and they should be turned over with the fingers every now and then throughout the whole operation. If the water supply be very limited, it is a good plan to give the prints a preliminary rinse, and then to immerse them one by one for a couple of minutes in a weak solution of a hypo eliminator, afterwards giving them half a dozen changes in plain water. The thicker papers, such as, for example, Aristo Collodio-carbon, and P. O. P. postcards, should for safety be given quite an hour and a half in running water.

A Hypo Test Where absolute elimination of hypo is essential, the final wash-water should be tested by adding a little freshly made starch paste to a small beaker or measure full of it, and then adding a drop of a solution of iodine, 5 grains; potassium iodide, 20 grains; water, 1 ounce. If hypo be present, no coloration will take place, but if the water be perfectly free from fixer it will immediately assume a pale lavender color.

Drying Prints One little plan only will I suggest for drying P. O. P. prints. Knock a couple of nails in the wall about four feet from the ground, and two inches apart, and a couple more in

corresponding positions on the opposite wall. Join each nail with the corresponding one on the wall opposite with string. You thus have two strings running side by side, two inches apart, like car lines. Lay the wet prints on these strings, and they will dry almost flat. Never surface-dry your prints, either collodion or gelatine, unless you are sure of the chemical purity of the blotting paper used.

The dried prints must, of course, be trimmed previous to mounting. The glass cutting shapes supplied nowadays will be found useful for trimming, but as they necessitate trimming all prints to the same size, their application is limited. Before trimming a print, cut out two L-shaped pieces of cardboard, and lay them over the print as shown in Fig. 3. By sliding them about, one can make the picture taller or shorter, wider or narrower, until it is found out in what shape and size it looks its best. Light pencil marks can then be made to indicate the trimming necessary.

An excellent way to trim prints is to lay them on a sheet of glass, place a steel rule over them, and cut along it with a sharp knife. A good, straight edge is thus easily obtained. The various ingenious cutting machines on the market would take up too much space to describe in this monograph, and I must perforce refrain from mentioning one or two exceedingly good makes. The advantage of the machine over the knife is the certainty of accurate rectangles.

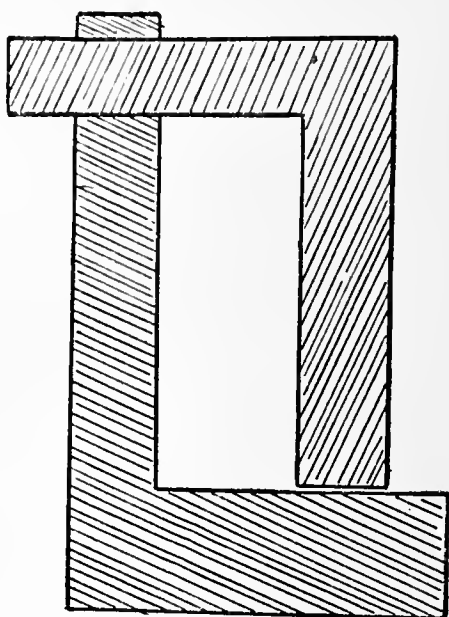


FIG. 3

Mounting is perhaps the least pleasant part of P. O. P. manipulation. One great point is to have a good mountant, and rather than the ordinary starch paste I recommend the dextrine mountant, a formula for which runs as follows: White dextrine, 6 ounces; hot water, 10 ounces; loaf-sugar, 1 ounce; alcohol, 1 ounce; thymol (1 per cent alcoholic solution), 1 dram. This should be thoroughly incorporated in a mortar. A good commercial mountant, such as that made by Higgins, will serve every purpose here with much less labor for the reader who does not desire to make his own.

Starch Mountant Starch paste can be easily made free from lumps by mixing the starch powder with enough cold water first to make a mixture of about the consistency of cream. It is then steadily stirred whilst boiling water is *slowly* poured upon it until it has thickened and almost become clear. The jelly thus formed should be strained through two thicknesses of muslin. It is a good plan to add a trace of carbolic acid or thymol to all kinds of mountants, as they not only require preservation in the wet state, but also after the print has been mounted. A mounted photograph which gets damp by any chance at once communicates the moisture to the mountant between the print and the card. Starch mountants should always be freshly made for use.

One of the easiest ways to mount a print is to place it first upon the card and mark lightly in pencil the position it has to occupy on the mount. Lay the print then on a sheet of clean paper, face downwards, sponge over the back of it with a damp sponge or wad of cotton wool, and now brush it over with the mountant, applying this with a fairly stiff brush. Lift up the print by one corner and lay it on the mount in the position indicated by the pencil marks, and lightly roll it down with a squeegee from top to bottom, then side to side. Finally, again sponge the *surface* of the print.

Spotting Mounted photographs sometimes have pinholes, white specks, etc., on them, which it is desirable to touch out. This is easily accomplished by using a very fine camel's-hair

brush, and a little carmine or burnt sienna,—ordinary water-color paints. If desired, a weak solution of gelatine may be made up and used hot, and a drop of this or a drop of gum mixed with some coloring matter on a bit of glass or a plate; the colored “medium” thus prepared will dry on the part applied with a glossy surface. The use of one of the commercial spotting colors is, of course, simpler.

Having now briefly detailed the whole orthodox manipulation of printing-out papers, I shall conclude by giving a few notes on out-of-the-way topics which, nevertheless, will be of interest to many of my readers.

Vignetting the photograph during printing scarcely requires mentioning here, as so many extremely cheap and efficacious vignettters are on the market, so that the trouble of making one's own is hardly warranted. It should be remembered, however, that when a paper or other vignetter is attached to the frame, printing should always be done in a very soft light, and never in sunshine or a soft vignette cannot be secured.

Reducing Over-printed P. O. P. pictures can sometimes be saved by reduction, but are best thrown away. A solution of two grains of potassium ferricyanide and twenty grains of ammonium sulphocyanide in three ounces of water may be tried before toning and fixing, but after the preliminary washing. The prints should be removed before they are quite sufficiently reduced, and washed for ten minutes in running water.

Enameling or “glazing” glossy P. O. P. prints is done by squeegeeing them down on glass or ferrotype plates. Thus a sheet of glass larger than the print is thoroughly cleaned with soap and water, then plain water, and allowed to dry. It is next polished on one side by rubbing it over with a clean rag and a drop or two of a solution of spermaceti wax dissolved in twenty times its weight of benzole. Let the print soak in a large vessel of water; dip the polished glass under the water also; bring the face of the print and the polished surface of the glass together, still under the water, withdraw them

together, and then squeegee the print down, lightly at first, then firmly. In this way perfect contact is ensured, the danger of air-bubbles avoided, and when dry the paper is easily stripped off and will be found to possess a highly glazed surface.

When glazing by means of a burnishing machine, a few drops of a solution of castile soap in methylated (or Columbian) spirit are rubbed with a rag over the surface of the dry print, which is then passed through the machine, the bar being about as hot as the hand can bear.

T. THORNE BAKER, F.C.S.

BOOKS

Without doubt, once acquainted with the general character and manipulation of printing-out papers, the best instruction books for practical use are the little manuals which tell how to use this or that paper, issued free by the manufacturers of the various brands of papers. The general text-books on the subject are as follows :

P. O. P., by A. Horsley Hinton. 1904. Cloth, 50 cts.

Aristotypes and How to Make Them. By W. E. Woodbury. 153 pages, illustrated. 1893. Paper, \$1.50.

Photographic Printing Processes. By Louis H. Hoyt (Dime Series), 1900. Paper, 10 cents.

P. O. P. A very complete and satisfactory monograph on all classes of print-out papers, by E. J. Wall, in the *Photo News Year Book* for 1900. This is now out of print and difficult to obtain in America.

An Appreciative Note on John Beeby and His Work

My knowledge of Mr. John Beeby and his work is derived from an intimate acquaintance with his photographic and pictorial efforts from the day, a novice in camera work, he joined the late Society of Amateur Photographers of New York, to the time when, better known in the photographic world, he left its successor, The Camera Club, to change his domicile to the Pacific Coast. It hardly requires any words from the former official critic of the above organizations, to tell the readers of THE PHOTO-MINIATURE about the status of Mr. Beeby in both technical and pictorial photography. A glance at whatever examples of his work he may offer you for reproduction, will, I am sure, far outweigh any review of them that I might write. Yet it may be proper for me to say, briefly, that Mr. Beeby's success as a pictorialist is entirely due to his own native ability, diligent self-culture and untiring zeal. It is true that his progress toward perfection in the technical operation of photographic processes was wonderfully helped by his associations with the galaxy of talented men in the membership of The Camera Club of New York, with Stieglitz, Post, Champney, Fraser, Berg, Scott and others; but his rapid rise, as a simple club member, almost hiding his light under a bushel, to the successful amateur, making his light so shine before men that they not only saw his good works but gave prizes for them all over the world, must be ascribed to his natural artistic temperament, to his ready perception of the pictorial possibilities of a scene, combined with a prodigious industry rarely associated with the other qualifications. Mr. Beeby is, essentially, a practical genius. His profession as an engraver constantly requires him

to produce decorative designs, embodying beautiful lines and colors which can be seen by others as well as himself, and it may be readily imagined that when the new school of photography arose, advocating, both by precept and example, suggestion rather than realization, he did not follow it very far. Mr. Beeby's pictures, therefore, are so expressed that it is not incumbent on the beholder to supply all the poetry necessary for their esthetic enjoyment. If the purpose of art be to edify and elevate the mind through the perceptions and sensibilities, surely this old-fashioned method of showing beautiful things in a beautiful manner is still to be commended. I am confident that among Mr. Beeby's selections will be found some examples of snow and fog and rain, under which conditions it is his delight to show the streets of a great commercial city, and to turn with a magic wand the dull prose of its busy life into the poetry and charm of fairy land. I leave your readers to the enjoyment of their pictorial wealth.

WM. M. MURRAY.

Notes and Comment

Mrs. Mary R. Stanbery, of Zanesville, Ohio, whose experiments in printing on special papers were described in *THE PHOTO-MINIATURE* No. 67, page 411, writes to us that the paper mentioned in her former communication is properly known as Chinese Pith Paper, the variety known as Chinese or Japanese rice paper being a different product. If any of our readers have experimented along the lines suggested by Mrs. Stanbery, we shall be glad to hear from them.



Dr. Edward Burton McDowell has lately returned from an extended trip to Panama, where he did a large amount of photographic work. In a letter concerning this work, in which Dr. McDowell most interestingly relates some of his photographic experiences, he takes

occasion to pay a very high tribute to the excellence of the Hammer Orthochromatic plate, which he considers unequaled for work of this kind. He says in part, "Your Orthochromatic is my ideal, and I am sending you herewith prints to illustrate its Ortho qualities; in fact, I am greatly elated over my success, for my negatives run very evenly for quality, etc."



We understand that the Kodak Press is about to issue a little volume entitled "Book of the £1000 Kodak Exhibition" in which will be reproduced some sixty pictures from among the best shown at the recent Kodak exhibition in London. A copy may be had at 25 cents, either from the Kodak dealer or from the Eastman Kodak Company.



We are informed that Colorprinté, the new paper for making photographs in the colors of nature, will be ready for the market by the time this reaches our readers. The advance sale has been extraordinarily large, and we are asked by the makers, Messrs. Howe and Hall, of Chicago, to say that all orders will be filled in rotation at as early a moment as possible. Dr. Wilhelm Hesekei, a brother and collaborator of the famous savant, Dr. Adolf Hesekei, is now located in Chicago to see that Americans are properly instructed in the workings of the new process. Colorprinté, while very simple, is of such revolutionary nature that it has been deemed best to have the advice and instruction of one who has been connected with it from its inception, as in anything new it is hardly to be expected that the most perfect results will be secured at the first trial.



As we announced in last month's issue, Burke & James, of Chicago and New York, have inaugurated another Ray Filter Competition. Cash prizes amounting to \$100 will be given away. All those who use the camera can enter this competition, and all pictures, either landscape or flowers, will be admitted, provided

that the pictures were made through a Burke & James Ray Filter, either the "Ideal" or "Isochrom." For full particulars, drop Messrs. Burke & James, Chicago, a postal card asking for circulars giving full details of this competition.



Those who can enjoy a simple, unaffected account of how one amateur began his course in photography should read the "Confessions of an Amateur Photographer" in the June number of *Sunset*. Mr. Little, with whose contributions to the photographic journals many of our readers will be familiar, graphically describes his adventures with his first camera, and later, his growth as a picture-maker along more serious lines. A paper by Mr. Little, giving his experience with the Wallace System of Development, will appear in our next issue, illustrating his further progress in the gentle art.




A somewhat stiffly technical but extremely interesting series of papers on "Modern Chemistry for Photographic Workers," by Mr. C. E. Kenneth Mees, is appearing in *The British Journal of Photography*. It is to be hoped that these will later be published in book form for the convenience of students.




The new Film Packs of 1905 retain the excellent quality which characterized them last summer, with the added advantage that it is now possible to remove one or more exposed films for development before the entire pack is exposed. This is very simply effected as follows: Take the camera or adapter to the dark-room, remove the pack, and break the red seal at the sides near the bottom, which will allow opening, thus giving access to the exposed film. After removing the film, the pack can be replaced without sealing in the camera or adapter before leaving the dark-room, and everything is ready for additional exposures. The Film Pack should be re-sealed immediately after removing it in daylight from the adapter, after the twelfth exposure has been made, by moistening the inside of the corner flaps, when they may be stuck

firmly to the sides. It is not advisable to seal the pack in the dark-room unless the entire number of exposures are to be made before further development.


When the readers of THE PHOTO-MINIATURE fully appreciate the many-sided advantages of the Film Pack we are confident that the manufacturers will have difficulty in supplying the demand for this most remarkable of modern photographic conveniences.



It is fifty-five years since M. Poitevin communicated to the French Academy of Sciences the first description of a sensitive gelatine dry-plate. With Poitevin's plates an exposure of two minutes was necessary even with a portrait lens, while a sunlit landscape required eighty to one hundred seconds. The developer was a 10 per cent solution of Gallic acid, and development occupied an hour and a half. What would be M. Poitevin's thoughts could he "re-visit this terrestrial globe" today and give an exposure of one twelve-hundredth second to a Lumière *Sigma* plate, securing a perfect negative after a development lasting four minutes!



"America's Only Photographic Weekly"—to wit: *The Photographer*, of New York, celebrated its first birthday a few weeks ago. There are spots in the sun, and there are spots in *The Photographer* which will stand a little retouching, but those who know best how patiently and persistently Editor Juan C. Abel has followed his weary "grind" will be heartiest in their congratulations. Some of our other weekly brethren will do well to look to their laurels when once *The Photographer* gets well "into the running."



We live in stirring times, and congratulations must come thick and fast. This note celebrates the award of an Honorary Fellowship in the Royal Photographic Society of Great Britain to Mr. Alfred Stieglitz. This outstanding recognition of the lifelong work of Mr. Stieglitz in behalf of pictorial photography in America

is timely and well bestowed. And it recalls the word :
"A prophet is not without honor, save in his own country and in his own house."



Hard of heart and close of fist indeed must be that photographer who could look through the pages of the New Century Camera Company's catalogue without a growing desire to go and sell all his goods and buy a *Century Grand Senior Special*. In this splendid instrument almost all the perfections of camera construction are gathered together for the lucky mortal who has \$150, more or less. Fortunately the same catalogue has equally persuasive attractions for the man whose means are less plethoric. The catalogue can be had for the asking from the Century Camera Company, Rochester, N. Y., and is as interesting a little book as we have seen in some time.



There are many signs of a healthy revival in carbon printing, and our mail brings continual inquiry for carbon supplies. We are glad to announce that from this time forward the firm of George Murphy Inc., 57 East 9th street, New York, will act as American agents for the famous Autotype Carbon Tissues and supplies, carrying a full stock for the prompt shipment of all orders. A detailed list of carbon supplies can be had on request.



The 1905 Kodak Poster is so thoroughly artistic a bit of work in design and color that we are inclined to wish ourselves among the dealers elect, so that we might possess one of the aforementioned Posters. The advertising department of the Eastman Kodak Company has a long record of clever work behind it, but this 1905 Poster is a notable achievement. If there be any virtue in pictorial publicity its display in a dealer's window should materially increase the demand for the Kodak this summer. Which reminds us that we have received the new Eastman catalogue, giving detailed information concerning Kodak novelties and improvements for 1905.

There is a steady advance in its pages to greater simplicity and efficiency in the Kodak and its accessories. Special attention is called to the new Kodak Tank Developing Machine, for which we predict even greater success than attended the Kodak Roll Film Developing Box.



A special feature of the Sunday edition of the *New York Times* is its four-page supplement presenting finely engraved reproductions of paintings, photographs of interest and the like. The splendid quality of these reproductions, surpassing anything of the sort we have thus far seen in the public press, was plainly demonstrated a few weeks ago by the presentation of a series of photographs by Gertrude Käsebier. In this collection the engraver preserved with wonderful fidelity the feeling and sentiment so marked in the work of this gifted portraitist, and the page was an honor to photography as well as to the skill of those who were concerned in its making.



Just as we go to press there comes to our table an advance copy of a new general catalogue (No. 9) issued by Messrs. Burke & James, Chicago and New York. It is a handsomely printed volume of 224 pages, and we note that almost every page shows considerable revision and much additional information concerning new goods, novelties in apparatus, etc. Readers of the PHOTO-MINIATURE who desire to keep abreast of the times should get a copy of this catalogue — free on request, and give it a careful reading. It will add considerably to their knowledge of things photographic and provide abundant encouragement in their photographic progress. Apart from all this the catalogue shows, unmistakably, the progressiveness and enterprise of Messrs. Burke & James in their endeavor to meet every requirement of amateur and professional photographers.

Postscript to No. 47 The Photo-Miniature

Under this heading will be published occasional postscripts to earlier numbers of The Photo-Miniature series, giving new or supplementary information.—[EDITOR.]

KALLITYPE TO DATE

In the August, 1904, issue of the *Photo Beacon* I submitted a Kallitype formula for the production of prints in black and white—a process that seemed to me to be as simple and cheap as one could hope for. Prints in black and white are possible by other Kallitype methods, but in none that I have tried are they so easily obtained as in the method suggested in my article, which may be described as follows: A suitable paper is coated with an iron solution, printed under a negative, giving a faintly defined image as in platinotype. A silver solution is at hand, in which the print is immersed, when instantly we get a vigorous image in blue-black. Fixing in weak hypo for a few minutes, washing for from half to a full hour and drying, as usual, completes the operation.

While beautiful prints are possible, and have been made by this process—pictures hardly to be distinguished from platinum—and at a trifling cost, I realized there was room for improvement. Unless the negative used had some white in the composition, it was a matter of considerable difficulty to decide the exact point when printing was completed, the image being yellow on a still paler yellow ground. During the past six months I have conducted numberless experiments in the hope of devising some mode of obtaining a more vigorous image in the frame without, in any manner, imparting

the quality of the finished print. The formula has been varied in every possible way and proportion, and after a thorough test I have come to the conclusion that in the shape I am about to present it, there are great possibilities. The printing is now more rapid, and the image on a heavily sized paper—especially on damp days—nearly prints out. The color of the provisional image is now darker than formerly, making the contrast between that and the ground more pronounced.

Quality of Paper to Use The regular Steinbach photographic papers may be selected for special work, but the ordinary papers of American make will answer well enough for ordinary purposes. Beautiful soft effects can be obtained on a well-sized vellum stock. Some of the most satisfactory pictures I have seen are on a thick grosgrain, dull-finished paper, giving a depth not attainable on smoother stock. Much the same effect may be had by using Whatman's water-color paper, rough and medium. This will require to be sized once or twice to keep the image on the surface, otherwise it will be flat. As a smooth surface paper for ordinary purposes, I can recommend Scotch linen ledger, much affected by pen draftsmen on account of the toughness of fiber and the abuse it can stand from erasure without impairing the surface. I personally made the acquaintance of this paper years ago, as a pen draftsman and magazine illustrator, having used much of it, and know of nothing better today for the photographer who prepares his own printing media. It comes in sheets 17 x 22, can be had of the wholesale paper dealer, and cost me within a year thirty cents a pound in five-pound lots.

Sizing It is for some purposes sufficiently well sized, but for "velvety" effects should have a coat of arrowroot. We will find it difficult to get soft effects on a hard paper without a good size as a foundation. Moreover, the deposit of silver which goes to make the image must be in an exceedingly minute state of division. This is what makes the platinotype so very desirable; we have in that a delicacy of gradation which always appeals to refined tastes. Where there is a wealth of metal parti-

cles, there we shall find velvety effects, whether the process be founded on silver or platinum. It matters not how we obtain it, we must have a richness in the deposit of metallic particles, or score a failure. The perfect picture of this character, whether it be of platinum or silver, while a thing to admire at a distance, is still more interesting and beautiful when examined by detail through a magnifying glass. Then, the deposit of metal in myriad dots of spatter work, or countless particles of fine sand as in the dunes, is manifest with all the perfection of multiple gradation. Thus every fine particle of the deposit of sizing has become a black spot, and the numberless spots of this character, piled one upon another, helps to make that depth and richness so much admired in iron prints. The success of such a picture depends much on the richness or multiplicity of the fine particles of metal, as a little thought will disclose.

For a size we may employ arrowroot, 2 grains to the ounce of water. Beat up in a bowl with a little cold water; add the remainder of the water hot, and with constant stirring, bringing to a boil in a water-bath, when the size will become clear. Half an ounce of wood alcohol for each ounce of water should now be added, and the size is ready to use.

A good gelatine size is made as follows: Water, 15 ounces; gelatine, 75 grains; alum, 45 grains; wood alcohol, 3 ounces. The gelatine should be first allowed to swell in cold water, then with constant stirring that and the alum should be added to the balance of the water hot. Size sheets by immersion, afterward hanging up by one corner to dry.

Formula No. 1. Black Tones, citrate
Sensitizing of iron and ammonia, 25 grains; ferric
oxalate (Merck's or Mallinckrodt's),
15 grains; chloride of copper, 8 grains; oxalate of
potass, 33 grains; silver nitrate, 15 grains; oxalic acid,
15 grains; gum arabic, 10 grains; distilled water, 1
ounce.

Measure out the water, and in half of it dissolve the silver nitrate. While that is dissolving, weigh the other ingredients into the other half of the water, which should be in a dark-colored bottle, such as the ferric oxalate is

sold in. Add the chemicals as they are weighed, in the order given, without shaking up the bottle. When all but the oxalic acid have been added (the acid should be reserved to the last), pour in the silver solution and any undissolved crystals that may be remaining; then add the oxalic acid and without shaking or agitating the bottle, put away in a dark place for 24 hours. Stir up the sediment at the bottom, then filter, discarding the gritty particles, after which the gum may be added, the solution now being ready for use. The sole reason for filtering is to eliminate the gritty substances which abraid the surface of the paper in coating, and cause rusty shadows. If absorbent cotton be used to filter, the wad should be squeezed dry into the bottle, rejecting only coarse particles. The yellow heavy sediment should not be thrown away, being necessary to the obtaining of the full effects of the printing capacity of the process. The gritty substance before mentioned is evidently mainly copper, which has a debasing effect on the image.

As variation in the method of mixing the solution might result in failure or inability to obtain the full benefit of the process, I have been thus particular in describing the mode deemed essential. During the past twelve months I have combined the ingredients in every possible manner and order, and have learned that it makes a considerable difference in results as to manner in which it is effected. Some of the other combinations I may submit later. I fully realize the fact that a slight variation in the quality of the chemicals used may affect results for good or ill, as the case may be. If one were always sure of getting chemically pure materials, even when bought of the druggist, it would simplify matters very much. But one never knows when the druggist resorts to substitution and something "just as good" is handed over the counter. We experimenters, however, are brought face to face with the truth when we find the chemical refuses to give the results that we know it should theoretically yield.

Possible	Perhaps from subtle cause after we
Failure	have mixed our sensitizer according to
	formula we find the resultant prints fog-
	stricken and unsatisfactory. The trouble may arise from

impurities in the gum, so only the clearest, choicest pieces should be employed.

Finding, then, our product below the standard, we are tempted to discard the solution and try again. In such an exigency we may be able to get good prints from this particular lot of sensitizer by the addition to it of from ten to twenty drops of platinum solution and from four to eight drops of bichromate of potass, 5 per cent solution.

The printing should be carried only so far as to show the deepest shadows, not a trace of the half-tones being perceptible. The image, moreover, will be of a purple or brown hue according as we use pure linen or paper of divers quality, the sizing, also, having a considerable influence in results.

As regards the gum we use in solutions, I have found it a good plan to wash it with warm water, thus freeing it from impurities which may have a debasing effect on the image. Washed in warm water and spread out on a clean plate until dry, the gum will then sparkle like so many diamonds.

Coating the
Paper

After trying other methods, I have come to the conclusion that for coating the paper there is nothing like a good soft rubber-bound brush in this present instance, where the sensitizer is not a clear liquid, but more of the nature of an emulsion. The flexible brush, made of a piece of celluloid folded and covered with cotton flannel, as described in THE PHOTO-MINIATURE No. 47, works exceedingly well, if one were always sure of getting the right sort of cotton flannel. At times I have been able to get a fine quality of flannel, but more often of late I have not. Such being my experience, and realizing the variations existing in quality of the article, I do not care to risk failure to others through any advice of mine. So I say to those who have no experience in coating, procure a good soft camel's-hair flat brush, not less than two, but preferably three or four inches wide, and rubber-bound. This should be kept away from dirt and dust, should be well washed immediately after using, letting it soak in clean water for some time to free it from all chemicals.

In coating I personally prefer small sheets of paper. I had rather have one well done than many coated in an indifferent manner, showing streaks and other imperfections in the finished prints. If the ledger paper be used, it should be cut in four, making a sheet $8\frac{1}{2} \times 11$ inches. Pin to a board with Kodak pins, pour a small pool of solution in the center, and with full-length rapid strokes go over every part. Niggling, short, undecided strokes will be evident in the finished print; therefore, let the brush marks go from top to bottom of the sheet without halting. The endeavor should be to wet the sheet of paper equally all over as quickly as possible, and without leaving any pools, which would dry darker than other less favored portions. When the sheet is surface-dry, complete by artificial heat, from 80 to 100° . Rough paper absorbs the solution quickly, therefore one application is usually sufficient; but for smooth, hard surface paper without a heavy sizing, two coats will be necessary, letting the first one dry thoroughly before the other one is applied. This, too, may be necessary to avoid patches and streaks in the finished product. Where a strong, vigorous print is desired it is a good plan to coat and quickly dry, giving a second application and drying quickly as before, which will keep the solution on the surface. Where the negative has strong contrasts, a single coat will be in order, but when the negative is of the pictorial order—rather thin but full of detail, two coats will be necessary. Smooth hard paper requires more, while rough or heavily sized papers will require less. The gum in the solution prevents the liquid sinking in too quickly and also keeps the image from floating away in the developing.

Underprint, rather than over-, showing none of the half-tones. Say it is a face we are printing: only the most prominent features should show; the detail of skin, eyes, or mouth should not appear at all. Take from the frame, being careful not to expose to strong light, and immerse in the developer, which should be made up as follows: Silver nitrate, 40 grains; citric acid, 10 grains; phosphate of soda, 2 grains; distilled water, 1 ounce.

This being a stock solution, we take of it one dram

to each ounce of water, adding about a grain of oxalic acid to each ounce. To measure out the amount of acid with scales each time will be quickly unnecessary if we remember that a piece of the acid about an eighth of an inch in size will answer for a grain. As far as my experience shows with this mode of adding the acid, the exact quantity called for in the formula gives prints of a blue-black, while a larger quantity produces an image of a pleasing brown-hued black, somewhat like old prints.

In the developer (which should always be in a glass or porcelain tray) the print will gain strength quickly, development usually being completed in about a minute. If underexposed, it may give sufficient strength by allowing print to remain for five minutes, or laying it on a flat dish or sheet of paper for that period of time, being careful not to touch any part with stained fingers. Prints should always be immersed face down, immediately turning them over to make certain there are no bubbles, which would leave white spots when dry. Touch lightly with the fingers or a glass rod, and the bubbles, if present, will vanish. Remove prints to clean water, rinsing for a minute or two, then transfer to the clearing bath of hypo made up in the proportion of 50 grains to 32 ounces of tap-water. Exact measurement here is not essential, as I generally in practice take a pinch of hypo to two ounces of water, but, as the former has a reducing action, it should not be used too strong or over long. Three minutes I have found sufficient, but when deeply or overprinted, five minutes or even longer may be found right. When the whites in the dried prints are not as pure as the paper, as shown on the back or around the margin, the time of clearing is evidently too short, and should be lengthened, at the same time printing a little deeper. Overprinting to a slight extent may be arrested in the hypo, but the under-printed picture should be thrown away, for it does not pay to bother with imperfect prints when the cost is so trifling. The sensitizer does not cost more than four cents an ounce to prepare, and two or three cents will cover the cost of a dozen 4x5 prints. Pictures quite the equal of platinotypes in appearance, and rivaling them in beauty of gradation from pure white to the

deepest of velvety black, are easily obtainable by this process, premising intelligent working, pure chemicals and the best linen paper. I wish it were possible for me to show all interested workers the pictures possible from the process. Kallitype experimenters I am certain would be delighted with the method, once they were acquainted with the cheapness, celerity of working, and beauty of the output. From time to time I have kept Mr. Todd posted as to what I have been doing, so he at least is thoroughly conversant with the possibilities.

**Overprinted
Prints**

Prints that are but slightly overprinted need not be thrown away, for by toning with uranium after the manner employed with platinum, all colors from rich velvety brown to red chalk are possible, and in a few minutes' manipulation. Moreover, prints thus treated seem to become richer in the deposit of metallic particles, giving to them a deep richness that cannot fail to be pleasing to all lovers of fine gradation in photographs.

**Another
Sensitizer**

As an alternative method, I here submit formula No. 2, which gives a stronger image, and of a brown-black nature. As a rule, one application of this will be sufficient, but if one has a thin negative, and desires a strong print from it, the paper may be coated twice, drying between each coat. Rough papers coated in this manner will give very fine blacks and not to be distinguished from platinum in appearance.

Formula No. 2, Black Tones, Chloride of copper, 8 grains; citrate of iron and ammonia, 28 grains; oxalate of potass, 35 grains; ferric oxalate, 28 grains; silver nitrate, 15 grains; oxalic acid, 15 grains; gum arabic, 10 grains; distilled water, 1 ounce. Mix in the order given, and in precisely the same manner as in Formula No. 1, filtering in the same way, discarding the gritty sediment, fixation and other manipulation as before described, although perhaps when rough paper be used, a minute more may be assigned for clearing.

Where the sensitizer is found to be too strong, reduce by the addition of distilled water. If not strong enough, add alternately citrate of iron and ammonia, and ferric oxalate a grain at a time, until the image is vigorous

enough. By the addition of from ten to twenty drops of the regular formula, pleasing purple tones of black are possible. As the image thus becomes more intense, dilution may be necessary. The platinum solution is made up from the formula that comes with each vial of chloro-platinite or the Aristo Platinum may be used.

In making up formula as here submitted, the blacks possibly may not mature precisely as per schedule. Sometimes from some subtle cause instead of the blue-black I have got a black with an olive-brown tone. This does not happen often, however, and when it does, the solution need not be discarded, for the color is not an objectionable one. I simply hint at this so as to put the worker on his guard, and I consider any color, blue-black or otherwise, desirable. Sometimes the addition of a grain or two of phosphate of soda will correct the brown shade and make prints of a true black.

I trust that those who aspire to the
Hints preparing of their own printing media
will give this process a fair trial. Those
who have in the past worked in Kallitype as usually
exploited will certainly find this interesting and free
from difficulties which might beset a beginner. They
will here find a most direct way of obtaining black and
white prints ever so much easier than any mode hereto-
fore known, and cheaper, too, as the formula will dis-
close. I know of no Kallitype formula where so small
a quantity of the iron oxalate and silver is deemed nec-
essary and results here as good as the best. Eight grains
of silver nitrate solution will develop a dozen 5 x 7
prints, for the small quantity of the metal in each print
helps to keep the developer up to the full strength, until
exhausted by waste or evaporation. It should be re-
membered at all times that the utmost cleanliness should
be observed in every part of the manipulation. One
should particularly guard against touching the prints
with silver-stained fingers, every such mark eventually
showing up yellow in the finished print, for water does
not seem to wash it away, no matter how long the wash-
ing operation may be. For this reason it is a good plan
to wash the hands occasionally, and when handling
the prints, doing so by taking between the finger and

thumb. As the developing stains the nails quite badly, rubber gloves or finger-tips may be used; but personally I prefer to use my bare finger-tips, erasing the stains by the use of chemicals and soap and scrub-brushes.

JAMES THOMSON.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

JULY, 1905

See page 552

Number 70

Advanced Pinhole Photography

Many works and papers, including a monograph in this series, have been written on pinhole photography, and it might well be thought that the last word had been said thereon, but such is not the case. It is to be regretted that most writers have dealt with the subject either as a complex optical problem, or as an interesting scientific hobby. Pinhole photography may be both of these; but the writer has no interest in either. The sole object of this little book is to deal with pinhole photography from a purely practical standpoint, and to show how the pinhole may be used to produce pictures with a serious purpose, with characteristics different from anything the lens can offer. The pinhole has been much advocated as a cheap outfit, and doubtless it is so; its true merit, however, does not lie in cheapness, but in the excellence of the work it can accomplish. When this latter is fully realized it will cease to be so very cheap. For example, I am convinced that the best results in pinhole photography are obtained in connection with large plates, 10 x 12 and larger. This means a large camera with proper adjustments. This is not theory, but a statement based on practical experience. Thus my exhibit, "Autumn Woods," taken on an 11 x 14 plate, was hung at the San Francisco Salon by a committee of artists without knowledge of by whom, or how it was produced; and it was the use of the pinhole that made its success possible.

The Pinhole Image

Before we deal with questions of technique, let us ask what is a pinhole picture, what its principle and advantages? A pinhole, or, more properly, a needlehole picture is an inverted image of any scene or object, formed by the passage of rays of light through a very small opening in place of the lens at the front of the camera. In practice this opening must not exceed 1 mm. ($\frac{1}{25}$ of an inch) or be less than 0.25 mm. ($\frac{1}{100}$ of an inch) in size. Images so formed are made by bundles of rays of light reflected from the object photographed, the size of the bundle being dependent on the size of the aperture through which it passes. The resulting image is therefore made up of a number of dots, each dot corresponding in color to the surface from which it was reflected, and in size to the aperture through which it passed. Necessarily, the rays in passing through the small aperture must cross, consequently the image is inverted. Furthermore, if the image is made up of large dots it will be correspondingly coarse and lacking in definition. To this extent, then, the image formed by a pinhole is similar in nature and principle to the image formed by a lens, but it possesses certain characteristics, some advantageous and some the opposite, that sharply distinguish it. Let us look at these in detail.

Points in Favor of the Pinhole

Freedom from distortion. The rays of light passing through a lens are bent in their course, and as a result various distortions of the image are produced. The rays entering through the needlehole aperture pass direct from the object to the sensitive surface, hence no distortion is possible. Chromatic and spherical aberration, astigmatism, and other defects inherent to lenses are entirely eliminated in pinhole work. The image given by the needlehole aperture upon the sensitive plate is an exact replica of the object photographed.

Infinite Depth of Field

With a lens, near and distant objects are never sharply defined at the same time. By the use of small stops or diaphragms they may be made approximately so, but even the smallest stop usually supplied will not bring into sharp definition an object a few inches from the

lens and a distant background. With the pinhole, there is, in this sense, no such thing as focus. Whether the camera extension be long or short, the objects near or distant, they will always be in focus on the ground glass. This point is well exemplified by the accompanying illustration—Plate I. It is that of a view taken through a picture-frame so placed that the frame, at a distance of six inches, was taken as well as the landscape distant by hundreds of yards; yet each is equally in focus. A pinhole reproduces a scene just as the eye sees it; or much more nearly so than the lens. Apart from the saving of trouble and error in focusing, this power is of technical advantage in the making of enlargements or where sharp focusing with a lens is difficult. While there is no focus for different planes in pinhole photography, there is a relation of pinhole to plate that gives the maximum definition.

Soft Definition When a lens is used to obtain a picture containing several planes, i.e., foreground, middle-distance and background, and all are required to show fair definition, the only way to obtain the same is to stop down. When this is done, we get intensely sharp definition in all the planes within the focus of the lens, the effects of aerial perspective are eliminated and the resulting photograph is false to nature. The pinhole treats all things alike. Sharp definition, in the sense of what a stopped-down lens will give, is not possible to it. Consequently we obtain a picture all the planes of which are reasonably defined, yet not one of them obtrudes itself unpleasantly on our notice. The result is entirely different from the so-called "fuzzywuzzy" effect of throwing the lens picture out of focus; though it is approached by the Dallmeyer and Beck Steinheil diffusing lenses. An out-of-focus picture always lacks strength, but not so the pinhole photograph; and it is this combination of softness with strength that gives to the pinhole photograph its essential character.

Control of Definition Furthermore, we have perfect control of the diffusion, for within the working limits of the apparatus it is proportionate to the size of the opening or pinhole aperture.

Better Massing of Lights One of the great causes of failure in landscape photography is due to the scattering of high lights. With the pinhole, and especially with large holes, the smaller lights are diffused into the surrounding darks, giving much better massing with increased breadth and strength. Compare the lens and pinhole pictures shown in Plates II and III, and note the breadth of the pinhole picture.

Control of View-Angle and Size of Image A lens of given focus at a given distance produces an image of a certain size, and includes on the plate a certain extent of field. These cannot be changed except by approaching or receding from the subject, or changing the lens for another of different focal length. The pinhole is entirely free from these limitations. By simply extending the bellows the individual objects increase in size on the ground glass, and the angle of view proportionately narrows. When the pinhole throws the image of a distant view on the screen it is of the same size as that which would be produced by a lens of the same focal length as the camera extension used. This power of instantly altering the angle of view and size of image is of the greatest value.

Absence of Halation Whatever theory may have to say on the matter, there can be no doubt of the fact that halation is reduced to a minimum by the use of the pinhole. The accompanying view through a window was taken expressly for the purpose of testing this point. It was given ten minutes' exposure so as to give detail in the shadow under the window, and yet the cross-bars of the window-sash are perfectly sharp, and the details of the curtain against the light are equally distinct with those of the curtain in shadow. See Plate IV. The advantage here offered in interior photography is obvious.

Disadvantages of the Pinhole Against these great many and obvious advantages, we have to set but two serious drawbacks; namely, the long exposure needed under most conditions, which practically eliminates the taking of objects in motion, and the lack of critical definition, which makes the pinhole unsuitable for a large class of technical and scientific subjects.

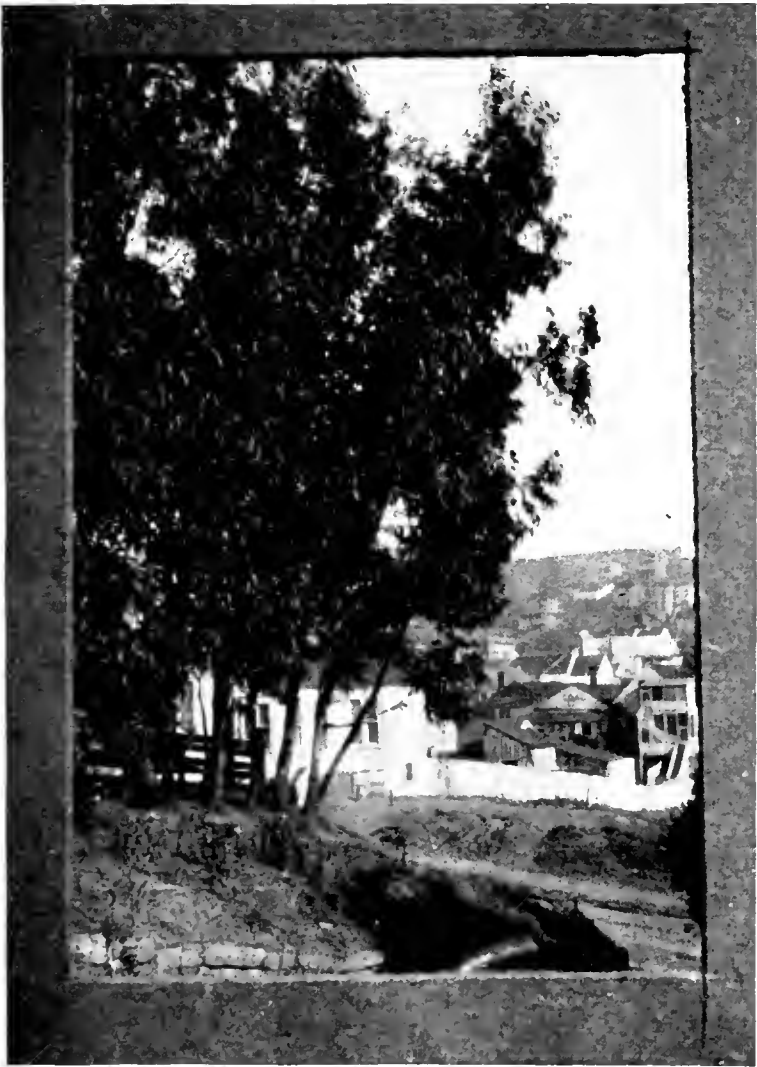


PLATE I. Pinhole photograph of distant landscape with frame near camera, illustrating the "infinite depth of field" possessed by the pinhole. See page 519.



FIG. 2. See page 523

Pinhole attachment devised by Dr. Power, with apertures numbered by his method. The diagram shows actual size 3 x 3 in.

The Pinhole and the Camera Writers on pinhole photography have given widely differing instructions in regard to the making of pinholes. Certain principles have been quite clearly laid down, but very little observed in practice, and herein is one of the chief causes of failure.

It has been previously stated that the pinhole image is made up of points that are proportional to the size of the hole through which the light passes. This is on the supposition that the aperture has breadth without depth, or diameter without thickness, which is a mathematical conception impossible of realization. Every pinhole has some depth, and is thus a tunnel with

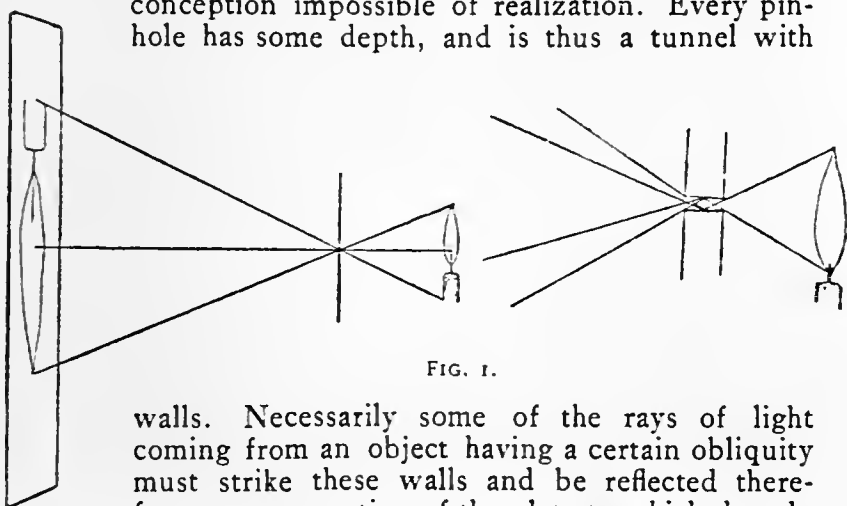


FIG. 1.

walls. Necessarily some of the rays of light coming from an object having a certain obliquity must strike these walls and be reflected therefrom on to a portion of the plate to which they do not belong. These reflected rays are much weaker than the direct rays, and furthermore, being scattered, produce no image, but they affect the plate, causing blurring and fog in proportion to their numbers. The thicker the plate the longer the tunnel constituting the pinhole, and the larger the amount of reflected light and blurring; hence, the definition given by a pinhole is proportional to the thinness of the plate in which it is made. Again, the smaller the size of the hole the thinner it has to be, or the proportion of reflected to transmitted light will increase. This is clearly illustrated in Fig. 1. Secondly, the pinhole must be perfectly free from jagged edges, or reflections and diffraction waves will be set up, which will further impair the purity of the image.

Thirdly, the holes should be of definite sizes and bear a photometric relation to one another. That is to say, like the stops used in connection with lenses, they should pass a given quantity of light and, as in the case of lens diaphragms, the amount should be half that of the next larger size. If this principle is not observed, the accurate timing of exposures is impossible or uncertain. Fourthly, the quality of the pinhole picture is dependent on the size of hole used; therefore, provision should be made rapidly to interchange all usable sizes.

As to cameras, there is little difference in the principle connected with the taking of pictures whether the lens or pinhole is used. The swingback is needed to correct the distortion resulting from tilting of the camera, but its use as in lens work, to equalize the focus of separate planes, is not needed, all planes being naturally in focus with the pinhole. The rising front is needed, and as there is little limit to the covering power of the pinhole, its movement may advantageously exceed that usual in lens cameras. Length of bellows should be great, as thereon will depend the angle of view and the absolute size of the parts of the picture. It must, however, be remembered that a long extension means a long exposure and proportionate liability to vibration. It is, therefore, needful that the camera be rigid in its construction. We deal here with the same conditions as confront us in telephoto work. Finally, an important use of the pinhole is in attaining views of extremely wide angle, and there should be the usual facility for folding or shortening the camera bed to keep it out of the field of view. In brief, it is the writer's opinion that all special pinhole cameras are a foolishness and delusion. Good work demands exactly the same kind of camera with both pinhole and lens.

The Pinhole Attachment While a perfectly recognizable image is formed by a hole 3 mm. ($\frac{1}{8}$ inch) on a plate of small size, the details would be so blurred as to render such an aperture of no value for pictorial purposes. Such a hole makes, however, a perfectly usable finder, enabling the photographer to place or "compose" his picture on the ground glass

and determine the best length of camera extension. The largest useful size of hole, giving broad and often beautiful effects on large plates, is one of 1 mm. ($\frac{1}{25}$ inch) in diameter. The smallest size capable of giving an image fairly free from diffraction phenomena is the 0.25 mm. ($\frac{1}{100}$ inch); between these sizes we have three others, namely, 0.75 mm. ($\frac{1}{38}$ inch); 0.5 mm. ($\frac{1}{50}$ inch); and 0.375 mm. ($\frac{1}{75}$ inch). These make a series of five holes that stand in the relation one to the other of passing, approximately, double the volume of light for each increase in size. These holes correspond in a general way to the needle sizes Nos. 16, 12, 11, 8, 6. The needle numbers by which pinhole apertures have hitherto been described are variable in size according to the manufacture, and produce holes of varying size according to the way in which they are used. It is, therefore, greatly to be desired that they drop entirely out of use, and that the "pinhole" or needlehole be known by its actual size, or by a number corresponding thereto. As a millimeter is the largest hole capable of giving a usable image, I call it No. 1, the smaller following in order up to No. 5. My reason for using these numbers instead of 16, 8, 4, 2, 1, which would equal their light intensities, will appear later. I prefer the millimeter to the inch because it is the measure used by all scientists, the general measure of the future, and the only one understood by our European colleagues.

These five holes, and the 3 mm. ($\frac{1}{8}$ inch) hole, must be made in the thinnest possible copper; each hole should be examined under the microscope, and measured with an eyepiece micrometer. Reject any found inaccurate in size, or showing a bur. The holes should then be soldered over corresponding larger holes in a circular metal plate, made to revolve over another plate bearing a central aperture, the whole being fastened on to a lens-board which at any moment can be exchanged for the one carrying the lens. The arrangement is shown in Fig. 2, which illustrates the apparatus made for me by H. Kuster, of San Francisco, wherewith all my work has been done. Recently I have used a slight modification of this arrangement, permitting me to employ a color screen or other apparatus behind the hole

and a convenient and simple shutter in front. There is nothing complicated or expensive in the apparatus described, but the workmanship must be good, the gauging of the holes accurate, and the material in which the holes are made sufficiently thin. I wish emphatically to protest against the idea that good pinhole photography can be done with any kind of a hole. Some of the pinhole attachments now on the market are useless for the purpose for which they are sold. In some, the material is so thick that they are really tunnels, not holes, in others the microscope shows ragged edges, and in none have I found accuracy in the size of the holes.*

As to the best method of making the
Making the holes, I would refer the reader to **THE**
Needlehole **PHOTO-MINIATURE** No. 27. The

method there given by Mr. Thomson is thoroughly practical and will yield very satisfactory apertures with reasonable care. In *Photography* of July 4, 1903, M. Combe, of Paris, gave an elaborate article on this detail with careful instructions. M. Combe ascertains the size of the needle he uses by placing one hundred of them side by side. He then measures the space they cover and divides the results by one hundred, thus obtaining the size of the individual needle. Having procured a needle of the required size, he proceeds as follows :

Combe's "Out of a sheet of brass as fine as pos-
Method sible, cut a square having a side about
 one inch in length. Put it on a sheet of
 glass and mark a cross on it lightly, with either a pencil
 or a sharp point, going from corner to corner so as to

* Dr. Power here surely protests too much. Ninety per cent of the pinhole photographs made, and certainly the best work of this sort we have seen, were produced by means of home-made pinholes, in the manufacture of which various sorts of material, e. g. brass, hard rubber, etc., were employed and often the crudest tools. Thus the remarkable pinhole photographs by Mr. James H. McCorkle, some of which have been reproduced in these pages, were made with a home-made attachment of hard rubber, described at length in **THE PHOTO-MINIATURE** No. 46. This attachment is now obtainable commercially from the Century Camera Co., Rochester, N. Y., and is completely reliable. Mention should also be made here of the "Watkins Pinhole Lens" introduced by Mr. Alfred Watkins, of meter fame, since Dr. Power wrote the above. The Watkins attachment consists of a circular wooden disc, cloth-covered, with springs by means of which it can be fitted to the hood of any lens not larger than 2 inches in diameter. Across the hole at the center of this disc is fixed a metal plate pierced with the pinhole, and an outer disc revolving on a pivot at its edge serves as a cap. The exposures are calculated by the method described by Dr. Power on a later page.—EDITOR.

find the exact center. Between the brass and the glass put a sheet of ordinary paper, and then, taking a stout needle, apply its point to the center of the piece of metal. A light blow of a hammer on the head of the needle will be found sufficient to make it pierce the metal without going through the thickness of the paper, and so reaching the glass. The hole is then made. We now take one of the hundred needles, the thickness of which we know, and make a head to it with a piece of sealing-wax. The point of this needle is then put into the hole we have made for just a little way, and the needle turned between the fingers. Take out the needle, and put the sheet of metal on the glass again, but this time put it the other way up, so that the bur is uppermost. With a *baton d'emer*i (a thin wood lath covered with fine emery paper) lightly rub the burs so as to remove them rather than push them back. When, on trying the edges of the hole with the finger, no roughness can be felt, the needle is again introduced, always putting it in from the same side, and pushing a little further in. Draw it out again, turn the metal over, and once more remove the burs. Repeat this operation three or four times, making the needle go a little further every time, until it will finally just pass right through the hole. When this is the case, turn it round a few times in the hole, then withdraw it, keeping it carefully at right angles to the metal. Do not touch the hole again with the emery; the hole is finished.

"The next thing to do is to blacken it. This is done with India ink on the side of the brass on which was the bur, since this is the side that is to be turned toward the inside of the camera. When it has been blackened, the needle is once more inserted in the hole and turned round once or twice to remove any of the India ink that may have lodged there."

A modification of this procedure is given by Mr. Henry Bowé in *Camera Craft* for October, 1904. He says, "The piece of metal that is used must be very thin, for by being so there is less to obstruct and less to be removed in widening the angle of the aperture. (See Fig. 3.) The edges can safely be thinned down to one

Bowé on
Making the
Pinhole

five-hundredth of an inch. Again, the pinhole, like a lens diaphragm, ought to be of a given size, both for convenience of timing exposure and adaptability to various subjects to be photographed. No. 8 needlehole is best, for example, for outdoor portraits, No. 10 for average landscapes, No. 11 for fine definition in landscapes and interiors, and No. 12 for copying and still-life in general. Lastly, the pinhole must be free from reflecting or brightly polished edges, for no matter how slight, such would reflect disturbing rays of light on the plate. (Fig. 4.) All this may look very formidable in print, but the few simple directions, if followed, will give a perfect pinhole plate.

To begin with, a thin sheet of metal is needed, preferably copper or bronze, a hard, smooth piece of wood, a slate-pencil with one end ground off flat, a sheet of

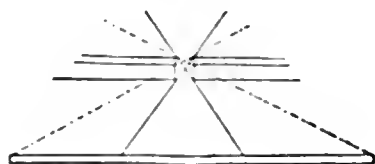


FIG. 3

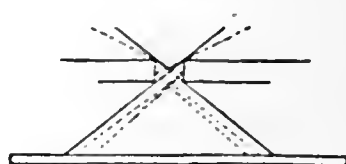


FIG. 4

glass, and a No. 5 needle; a No. 10, a No. 11, and a No. 12 needle will also be required in sizing the holes. The fine needles are each pushed by the eye end into a thick penholder for a handle and convenience. The metal plate is best got from a jeweler. He can anneal a cent and roll it flat until it is about nine inches or more in length. It will then be about one-three hundred and fiftieth of an inch in thickness, and can be readily pierced like paper, although firm enough to remain flat.

Having cut the metal sheet into small pieces to suit the fancy, with a pair of scissors, one of them is placed on the flat piece of wood, and, using the No. 5 needle, the point is pressed sufficiently through the metal to leave a hole which is barely discernible on the other side. (Fig. 5.) The metal plate is put on the glass, and with the flat part of the pencil the little bur that was formed on the back is ground down until it is perfectly

smooth on both sides, using a little water as a lubricator while rubbing. (Fig. 6.) Then the No. 12 needle is taken and twirled in the hole from both sides to enlarge it. The plate is put on a card to keep it flat. All this must be done very gently and only a little at a time. Both sides must be rubbed down after twirling the needle in the hole. The hole is finished with the side of needle corresponding to the number desired, viz., a No. 10 needle for a No. 10 hole and so on.

Finishing the Apertures After each enlarging of the hole it must be rubbed down, keeping the pencil wet. Both these items are important. When the pinhole is finished a small hard piece of wood is taken and sharpened to a very fine point.

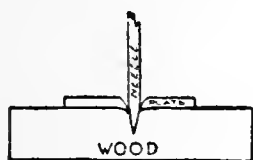


FIG. 5

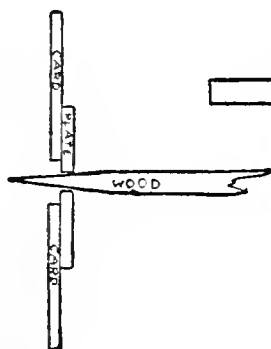


FIG. 7

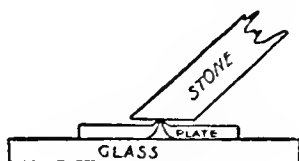


FIG. 6

On it is to be put a little of any polishing substance which may be handy, some of the pencil grinding can be used, and, inserting the point carefully into the pinhole, it is twirled round and round very gently to smooth and polish it. (Fig. 7.) The pinhole is cleaned out carefully with a new and clean point, and, after wiping it with a soft rag or paper, the whole is blackened by exposing it to sulphur fumes or by using a 10 per cent solution of potassium sulphide. This to ensure against reflections. The plate can then be put between two cards with holes one-fourth of an inch in diameter cut in both of them; they are pasted together, which makes

it safe and easy to handle them. The pinhole should be kept free from dirt and dust.

In the same article by M. Combe, referred to on an earlier page, is given an exact method of making accurately sized *square* holes, the edges of which, being made by cutting instead of punching, are entirely free from bur. The hole is made by sliding two elbowed pieces of thin metal over each other. One piece is fixed, the other is moved by a micrometer screw, so that the size



of the hole may be thus adjusted. Apart from having one adjustable hole instead of several, the special point claimed is that the edges, being cut instead of punched, are truer and sharper. Personally, I have not been able to verify this contention. Using the sharpest eye scissors I could obtain,

I still found under the microscope that the edges were decidedly ragged. In so far as the general worker is concerned, I am strongly of opinion that it is entirely a



mistake for him to attempt to make his pinholes; unless he has mechanical skill and practice he will fail. The arrangement that I have figured can be bought for a small sum. I would, however, always advise the reader who buys a pinhole to examine it carefully with a lens to ascertain that it is free from bur; and, if he has access to a micrometer eyepiece, he should measure the

holes to see that they are of the size described. In passing, I may warn the reader that the work turned out by even the best known firms in all departments of photography needs checking. Focal lengths, and shutter speeds, sensibility of emulsions, and so on are too often inaccurately stated.

We will now proceed to consider the technique of taking a lensless photograph.

We have to remember that pinhole

The Tripod exposures are often very prolonged; in the course of, say, half an hour's exposure the camera may be disturbed by wind, or a portion sag, or one of the tripod legs may slip or sink into the ground, and that a very trifling displacement of this kind may entirely destroy the value of the negative. It is therefore important to have a strong tripod; to screw the legs together tightly; and to take the same precaution with the screw of the rising front, if that be used. Furthermore, in placing the tripod legs, they should be pushed firmly into the surface on which they rest.

The Picture on the Ground-glass Many writers on lensless photography have made no use of the ground-glass, but have used an erect wire finder, such as is so largely employed on cameras of German manufacture. Thus to discard the focusing screen is a mistake, and sacrifices one of the chief advantages of the pinhole, namely, the power to arrange exactly the amount and size of the objects to be photographed. The reason why most writers have made no use of the focusing screen is the small amount of light admitted by the largest usable pinhole, and the impossibility of seeing any image except under the most brilliant lighting. If, however, we increase the size of the pinhole to three mm., we have as much light as with a lens stopped to about $f/32$. This is ample to arrange the picture under most illuminations, especially as focusing is not required. The picture given by such a large hole is, of course, in the highest degree blurred, as may be seen in Plate V, which was taken by a finder of this size. Nevertheless, there is no difficulty in choosing or arranging the picture by this means; in fact, the color contrasts give to the image on the ground-glass better

definition than is seen in the photograph. When using this finder in interiors, the same device must be employed as in lens work; namely, the limits of the field must be found by focusing on a light. Thus, if a definite area of a given interior has to be taken, it can easily be done by placing two lights, one at each diagonal of the area. The camera is then extended until the images of these lights occupy the margin of the ground-glass, in which case the scene will not only be correctly placed, but it will fill the place to the best advantage from the given point of view.

Choice of the Size of Hole We have, as described, five holes of diminishing size, each passing half the light of the last. What are the principles that shall guide us in choice of size to use for a given picture? It may be broadly stated that the circles of confusion in a pinhole picture are proportionate to the size of the pinhole. Consequently, the smaller the size used the greater its capacity to reproduce fine detail. At about 0.25 mm., diffraction waves are formed which produce blurring and become more pronounced the more the size is diminished. This sets a limit to the use of small apertures just as the increasing coarseness of the image sets a limit to the use of anything larger than 1 mm. It has been contended by many writers that the choice of size of pinhole should be determined by the distance the plate is removed from the hole; that there is something in the nature of a focus, a point at which each size gives its best definition. M. Combe, in the article already referred to, says that this may be ascertained by multiplying the size of the hole by one hundred, squaring the product, and dividing by eight. Thus a No. 2 hole would work out about as follows:

$$\frac{0.38 \times 100 \times 38}{8} = 18 \text{ cm. or } 7 \text{ inches.}$$

It is possible that in copying fine work this may be of practical account, but in my experience of actual work in the field, this relation of camera extension to size of hole may be safely disregarded, and the rule adopted that for a given size of plate, the larger the hole the

coarser the image whatever the extension may be. It is, however, to be remembered that the size of the picture, and consequently the greater the distance from which it will probably be viewed, has a bearing on the apparent definition of the picture. Thus, a large picture taken with a large hole, viewed at a distance, will seemingly show more detail, at that viewpoint, than one taken with a smaller hole viewed at too close a range. Let us now compare the use of these five holes in practice. Say that we wish the pictures of an oak, an elm, a pine and a poplar. No. 5 pinhole would give pictures of them that could be used by a botanist to obtain information concerning their minute anatomy, but No. 1 would give generalized pictures, correct in their distribution of light and shade and form, so that an observer would not have a moment's doubt as to which tree was depicted; yet he would look in vain for details of leaf or bark. The trees would appear just as an artist would sketch them, and yet they would be devoid of that unpleasant out-of-focus effect that is so annoying in the work of some so-called "fuzzywuzzists."

It is a fundamental principle in the graphic arts that the object of all delineation is an effect,—an effect on the imagination or emotion of the observer. Everything that does not aid in obtaining that effect is a hindrance and distraction. If you walk through an autumn woodland, and would have others feel that beauty of sunlit foliage softened by the morning mist, you must depict it as it appeared to you and in no other way. What you felt was not produced by noting the venation of a leaf, for if you had examined the leaf you would have ceased to look at the landscape. Consequently, your photographic method must be such as to suppress the leaf, as a leaf, while retaining it as part of the beauty that you were stirred to perpetuate. And in the case of pinhole work you would succeed with aperture No. 1 and get altogether too much with aperture No. 5. This point is well illustrated by my picture entitled "Through Autumn Woods," which could gain nothing by greater rendering of detail.* This was taken with No. 1 pin-

* Unfortunately not received in time for reproduction.—EDITOR.

hole at eight inches draw, on an 11 x 14 plate, the morning being misty and the lighting uncertain; the exposure, calculated as will be described later, was thirty-five seconds.

But pictorial effects do not always require suppression of detail; on the contrary, they may demand just the opposite. The majesty of a Gothic cathedral, when we stand beneath its groined nave, is not adequately rendered by mere suggestion of the carving of gargoyle and sculptured font. The very spirit of that medieval past is enshrined in its sculptures, and we must reproduce them or lose the effect that stirred us. With such subjects aperture No. 5 would give us what we want where aperture No. 1 would fail. The force of this contention will be better appreciated by examining the five views of the Art Museum, San Francisco, Plates V to IX, which were taken one after the other by apertures Nos. 1, 2, 4 and 5. Plate V was taken by the finder aperture and is inserted simply to show the use of that pinhole. It will be seen that a diffusion of focus that is very charming in "Autumn Woods," or that seen in Plate III, is unpleasant when applied to a building whose interest largely lies in the bas relief covering its walls. Many subjects, perhaps most, occupy a position midway between the cases I have described, and will be better rendered by apertures Nos. 2, 3 or 4. This must be a matter of judgment and experience. I can only indicate the principle, not deduce a rule. Furthermore, it is to be remembered that the choice of the pinhole will be affected by the size of the picture. A diffusion of focus that would be very unpleasant in a 4 x 5 picture might give no such effect on an 11 x 14, partly because the observer would naturally examine the latter from a greater distance, and partly because a large picture is usually taken with a longer extension of bellows.

So far, I have spoken of the size of
 Apertures and pinholes solely with reference to sharp-
 Exposures ness or diffusion; they must also be considered from the point of view of exposure time. Take, for example, the views of the Art Museum, where that made with aperture No. 1 received an exposure of two

seconds, No. 4 received forty-five seconds, and No. 5 seventy-five seconds. This may be immaterial if it is only a matter of time, but often there is movement to consider, both of objects and of shadows as in woodland scenes, so that it may happen that when there is much movement the larger hole may give the sharper picture, owing to the lessened blowing.

Calculating Exposures In all photographic manipulation there is probably nothing so fundamentally important as the correct determination of the exposure time. In lens work, this is gauged by the judgment of the operator, from the brightness of the image on the ground-glass, or in accordance with the indications of an exposure meter. It is true that the hand-camera worker is generally compelled to make his exposures on the impression afforded by the general lighting; but instantaneous work is done under well-defined and simple conditions, and in the aggregate yields only mediocre results. Lensless photography works with very small quantities of light, and is therefore very sensitive to small variations in its intensity or distribution. Thus, the differences of bellows extension which, with the lens, we usually disregard as unimportant, cannot be so treated when using the pinhole; every inch of extension making a marked difference in the exposure time. With a battery of five holes as described, the smallest requires sixteen times the exposure of the largest. As we may take lensless pictures at any bellows extension from, let us say, three to twenty-three inches, we have a hundred different exposure times, and this without any reference to the amount or actinism of the light, or the position and color of the object to be photographed. Such a multiplicity of factors are quite beyond the power of rational judgment. No aid can be obtained from the ground-glass, as the same hole is not used in placing and taking the image. Exposure meters can afford little assistance until we know the *f*/value of the pinhole, or rather the conditions that can be so expressed. With these difficulties in determining the all-important matter of correct exposure, it is not a matter of wonder that pinhole photography is not more popular as yet.

The Difficulties In the very beginning of my studies I perceived that no real progress was possible unless a quick and accurate method of timing exposures could be devised, and one, moreover, that could be used in connection with an exposure meter or without it. Various workers had already attacked the problem. Some working from theoretical data had arrived at very discordant results, others offered tables and methods that required paper and pencil to work out the exposure time. So far as I can judge, the whole subject has been dealt with too much from the standpoint of theoretical optics, and without regard to direct experiment. When first I commenced to work on the problem, it became evident that if I could, experimentally, establish conditions, it would be possible to find a rule for expressing the relations with other sized pinholes, and other camera extensions. In the summer of 1902 I commenced experimenting along these lines, and finally made an observation on which the conclusions I have to offer are based. The observation I refer to was made under the following conditions and experiments:

The Basis of the Author's Method I chose for comparison a Turner-Reich anastigmat of $10\frac{1}{2}$ in. focal length and a No. 11 pinhole, the diameter of which, micrometrically measured, was 0.45 of a millimeter. With this lens, a landscape view required a bellows extension of eleven inches. At the same extension, the pinhole picture on the screen is identical with that of the lens and, therefore, comparable. After making many trials, I finally obtained a pinhole and a lens exposure on the same subject, and taken immediately following one another, that, developed in the same bath, yielded negatives identical in density and printing time. The plates used were Seed's 26X, reckoned at 120 Watkins meter speed; the light was 15 seconds (Watkins); the diaphragm $f/32$; the exposure time as shown by the meter was one second, and this proved to be correct. The exposure given to the pinhole was sixty seconds. From this experiment, I deduced the rule, *That whatever might be the variation in light or plate speed, if the diaphragm be placed at 32, and*

the exposure time, as indicated on the Watkins meter, and read as minutes in lieu of seconds, or hours in place of minutes, will always be correct for a No. 11 pinhole, at eleven inches from the plate.

Its Practical Application As light diminishes and exposure time increases proportionately to the square of the distance, it was quite a simple matter to calculate the diaphragm numbers that correspond to other distances of plate from pinhole. As the exposure time is also proportionate to the area of the holes, these being known, it was easy to calculate the diaphragm number that corresponded to each. On this observation and its calculated results, I constructed an exposure table to be used in conjunction with an exposure meter which I published in *Camera Craft*, November, 1902. In constructing this table, I perceived that a certain relation existed between the numbers that seemed capable of reduction to a formula, that would do away with the need of any kind of table, however simple. For this formula to be both accurate and of easy application, it was necessary to have the pinholes accurate in size, and the sizes standing in a simple mathematical relationship to one another. This meant the discarding of the variously numbered needles as gauges and designations for the holes, as the numbers used by different needle manufacturers vary, the size of the hole also varies with the way in which the needle is used to make it, and the relation between the various sized needles is not a simple one. In devising a new standard, I chose the millimeter as my unit, for the reason that it is: First, the largest sized hole capable of yielding a satisfactory picture. Secondly, being metric, it is the standard of science. Starting with the millimeter hole as No. 1, the rest diminish in such a ratio that each passes half the light of the preceding. This is a great simplification, and makes the transition from one hole to another an easy matter.

Influence of Bellows Extension The second factor in the exposure time is the length of bellows extension. This is usually stated to be in accordance with the law that light decreases in proportion to the square of the distance from its source.

This is not strictly true in practice, for the reason that the source of light in a photographic image is a surface and not a mathematical point, as the law requires. Still the exposure times obtained on this basis are practically correct for our purposes. It would be unprofitable to describe the calculations that led me to formulate my exposure law. Before stating the latter, let me explain that the five holes, running in size from one mm. to a quarter mm., are numbered 1, 2, 3, 4 and 5 respectively, and hereafter they will be spoken of by these numbers and not by their actual sizes, or their correspondence to some needle size. Thus, if I refer to a No. 3 hole, an aperture of one-half a mm. is meant, and so on. Using these names for the sizes specified, the following rule of exposure will be found universally applicable and yield practically correct results.

The Rule The number of the hole used multiplied by the extension of the camera in inches, equals the $f/$ value of the hole, providing the resulting exposure time is read in minutes in place of seconds; or, in other words, multiplied by sixty.

How the Rule Works Now let us see how this works: Suppose we wish to photograph a landscape with a No. 2 hole, and to get the right view on the plate we have extended the bellows to eight inches. By our rule we multiply the number of the hole by the extension, that is, in this case, $2 \times 8 = 16$. If, therefore, in our judgment, or by an exposure meter, this landscape, taken with the lens stopped down to $f/16$ required half a second exposure, we should give it half a minute. Or, if working in a forest glade with a No. 3 hole we extended the camera to sixteen inches, we would have $3 \times 16 = 48$; and, if then in our judgment a lens at $f/48$ required, say, twenty seconds, we would give the plate twenty minutes. Nothing could be more simple. Used in conjunction with an exposure meter, this system attains to perfect accuracy. Let us take, for example, a landscape exposure with a No. 4 hole and a bellows extension of eight inches, $8 \times 4 = 32$. If the plate speed were ninety, and the time taken to darken the paper on a Wynne meter were thirty seconds,

then the answer as given by that meter for a lens exposure at $f/32$ is four seconds, which we convert into four minutes, according to the rule.

It can hardly be denied that nothing **Its Simplicity** can exceed in simplicity this method of determining exposure time with the pinhole aperture; never making any greater call on the mathematical power of the worker than the multiplication of one simple number by another. There only remains to consider the question of its accuracy in practice. I do not know and am quite indifferent as to whether it is open to criticism on theoretical grounds; but I do know that the writers who have dealt with the subject from the theoretical standpoint are hopelessly at variance, and that after three years' constant use, during which photographs have been taken with continually varying arrangements of pinhole size and camera extension, indoors and out, my method has never misled me and every illustration in this book has been taken in accordance with its indications. It has also been adopted by Mr. Alfred Watkins.

If further demonstration is needed, it **A Practical Test** is supplied by the print from a test plate made as follows: An illuminated surface made by placing a sperm candle in a lantern, the front of which was covered with white paper, was used as a test object on which to make the exposure. This was photographed by each of the pinholes in succession, in accordance with the indications of the exposure rule. The films were simultaneously developed in the same bath, and printed together in one frame for the same period of time. (See Plate X.) It will be seen that the five exposures have yielded images of the same density. When I first made this experiment, the image given by No. 5 (a size I rarely use) came out much too light. Feeling sure of the correctness of the rule, I remeasured the holes and found No. 5 less than half its proper area, this accounting for the difference.

Before leaving this subject, it may be **Adaptation** pointed out to those who are using needleholes of the old standard sizes that some of these later stand in such close relationship to

my numbers that the rule is roughly applicable to them. This is shown by the following table :

No.	MM.	NEEDLE NO.	MM.
1	1.00		
2	0.75	4	0.8
3	0.5	11	0.5
4	0.375	12	0.4

**View Angles
and Camera
Extension**

One of the greatest advantages that the pinhole possesses over the lens is the power it gives its user to adapt exactly the size of the image he wishes to reproduce to the dimensions of the plate. For example, the camera is set up to photograph a distant group of trees, and on examining the ground-glass it is found that they are too small and too much of their uninteresting surroundings are included. With the lens, it would be necessary to change to one of greater focal length or to approach closer to the subject. With the pinhole it is only required to extend the bellows until the group of trees grows to the required size on the ground-glass or plate. This power has no limit in outward range except the great increase in exposure time that its excessive application would entail. Twenty-four inches is about the greatest extension that I have used. The drawing in of the pinhole toward the plate is limited by the fact that when a point is reached where the center of the plate is very much nearer the pinhole than the edges, the illumination of the same will very rapidly fall off. By careful development and printing, such defects may largely be made good and immensely wide angles taken; that is, always provided that the hole is made in sufficiently thin metal. A theoretically perfect hole, that is, one having no depth, would include an angle of 180° , and the size would make no difference in the covering power. But as real holes have depth and the smallest and largest are usually made in the same thickness of plate, it necessarily follows that the small holes are tunnels of relatively greater length than the larger; they therefore cut off a greater number of oblique rays, and have a narrower angle of view. With reasonable exten-

sions of the camera, these differences in angular aperture of the holes are insignificant. The four views, V, VI, VII, and VIII, were made from the same standpoint, by changing from one hole to the other, yet all have practically the same view-angle.

**Special Uses
for the
Pinhole**

While the pinhole can be used for all but rapidly moving objects, there are, nevertheless, certain fields in which it excels. It is first of all to be remembered that the question of exposure is all-important, and that while very different exposures will yield pictures, the resulting tone values will be very different according to whether a long, medium or short exposure has been given. Owing to the length of time necessary to impress the plate, exact adaptation to the desired result is more easily attained than with the lens. If I may judge, from the pictures I sometimes see, as illustrations to articles on this subject, which usually have a predominant gray appearance with lack of full tones, it would seem as though overexposure were too commonly practised. This aspect of pinhole photography should be carefully studied by the novice, and exposures half and double the normal often made for the purpose of noting the effect. If a pinhole picture has not the range of gradation that the same subject taken by the lens shows, let the fault be sought in the user rather than in the instrument.

**Architecture
and Street
Screens**

I know of no field in which the pinhole can do better work than here. In interiors the absolute correctness of drawing which is peculiar to it finds a valuable application. Particularly useful here is the power to exactly adapt the field of view to the plate. Thus, from the same standpoint, which perhaps may be the only one available, both narrow- and wide-angled views may be taken. Such exposures are usually long, and the presence of people in the building has rarely any effect upon the plate. With gloomy interiors the plate may have to be exposed for hours. On one occasion, I was asked to take the photograph of a large and gloomy amphitheater, which demanded an angle such as no lens except a Goerz-Hypergon could cover. I obtained a satisfactory picture on an 11 x 14 plate after twenty-four

hours' exposure, people having passed repeatedly in and out of the room in the interval.

Exterior views of buildings and streets are particularly adapted to lensless photography. Returning recently from a visit to Europe, I found that all my best negatives were so taken. A good example is that on Plate XI, of the West Gate, Southampton, England. In taking this, I was cooped up in a narrow street with people constantly passing. But the pinhole enabled me to get exactly what I wanted on the plate, and to eliminate entirely the passers-by while giving full exposure to the subject. In the case of sunlit buildings, remarkably short exposures, such as a quarter of a second, will give good detail. (See Plate XII .)

Woodland and Trees

There is no more beautiful field in nature than that offered the photographer in the varying aspects of woodland and forest. Their entrancing transitions are a wonder and often a despair. They call for plates, plates, plates, and when we have the product, an adequate realization of our failure fills the waste-basket. I know well that many workers, notably the English, have succeeded in giving us beautiful renderings of such scenes ; but, taken as a whole, and viewing the mass of woodland photographs, it is apparent that the success is only occasional.

Sunlight Effects

Especially is this the case in the rendering of sunshine. It is just these sunlit vistas, with gold on trunk and spray, that are so attractive. The average photograph of such scenes is usually a distracting assemblage of high lights ; massed here, scattered there, but omnipresent and confusing, destroying all breadth and giving some of the form but none of the spirit of the original. What are the reasons for this ? There are several. The first and most important is that the curved surfaces of the leaves and twigs act as so many mirrors, each shooting a tiny beam of strong light on the lens. As such beams do not come from the whole leaf, but from a small surface of it, they produce on the plate nothing but a detached spot of light. Secondly, the chief charm of a sunlit forest is not in the reflected light, but in the light transmitted through the leaves ; and just because of their

beautiful emerald color, the plate, insensitive to green, takes no record of them. By thus recording what is not wanted and not recording what is most lovely, we are left with an entirely false scheme of lighting. Thirdly, the gamut of tones is very long in the woods; from the deep shadows in the brush and beneath dark and closely placed trunks to the high lights on a sunlit leaf or flower, we have every possible gradation. Adequately to deal with these conditions, requires great care and judgment, and the best we can do is a compromise. If such be the difficulties of woodland photography, how may they best be overcome? Take first the question of scattered reflected lights; these, of course, are most pronounced when the sun is shining. In the suffused light of a cloudy day they cause little trouble, and though under such conditions the forest may seem silent and somber, it is still capable of yielding most charming pictures. Differences of local color show up to much better advantage, and just as an over-lighted picture that fails to impress may reveal unexpected beauty in the shade, so may we find beauties under a cloudy sky that disappear in the glare of the sun. Some of the illustrations are examples of this kind of lighting, and there is a harvest for all who seek pictures under these conditions. But sunlight, while it destroys soft gradation, has beauties of its own demanding our best efforts. The scattered high lights that are its inevitable accompaniment must be eliminated. This is best done by the use of the pinhole. The latter, especially the larger sizes (Nos. 1 and 2) give a much more diffused image than the lens, and merge these annoying points of light into one another. The result is a rendering of sunshine such as the lens can never give. I have, recently, taken repeatedly woods and trees by both lens and the pinhole under these conditions, and in every instance the latter has given truer and more satisfactory rendering. I give examples which, while not put forward as of pictorial merit, do, I maintain, reproduce the spirit of that which they portray. Thus the contrasting masses of light and shadow in Plates XIII, XIV and XV give the sense of sunshine and atmosphere in a manner that a lens picture would not realize.

Suggestions for Selection Speaking of the rendering of sunshine, I cannot emphasize too strongly the importance of selecting subjects in which the sunlit parts are broadly massed against a body of shade, otherwise disappointment will certainly follow. The second difficulty, namely, the representation of light passing through a woof of green leaves can be overcome by the use of plates specially sensitized for green; but even this will not succeed unless backed by the use of a ray-filter of deep color. I have not tried it, but it appears reasonable to believe that a green filter would give the best results. I have used Seed's L Ortho plates and a bichromate cell in connection with the pinhole, and the picture, Plate XVI, was taken in this manner. Lastly, the long gamut of tones to be represented in these scenes requires very careful exposure. Nearly all the colors are non-actinic, and in using a light meter it is well to consider the subject value as at least three times the normal. Over-exposure is a much smaller evil than under-exposure, and if, as a result, we lose detail in the high lights, the same may often be recovered by local reduction. I would therefore summarize by saying:—First, use a pinhole, a large size by preference. Second, choose subjects with broad effects of light and shade. Third, use orthochromatic plates and a ray-filter. Fourth, expose for the shadows, and locally reduce the high lights if necessary.

Portraiture The use of the pinhole in portraiture is limited solely by the question of exposure time. Pinhole portraits have advantages over the product of the lens. They exhibit less distortion, every part of the subject is in focus, however close the camera may be; and finally, they are delightfully soft. But the length of exposure is a serious difficulty. The factors concerned are light, bellows extension and size of pinhole. Let us consider them separately. First, as to the light: it is impossible to work indoors except in a brilliantly lighted gallery. Out-of-doors the light time (Wynne meter) should not exceed thirty seconds. The average light on a bright day is about fifteen seconds. The bellows extension is determined by two factors, viz., size of pic-

ture required and possible distance of the subject from the camera. When the subject and plate are equally distant from the pinhole, the image will be the same size as the object; and as the latter recedes the image diminishes proportionately. Apply this to the taking of a bust, and see how it works. Let us say, we want this on a 5 x 7 plate; that is, about one-fourth of the natural size. The shorter the bellows extension the quicker the exposure. If we fix the extension at six inches, we will have a quarter reduction with the sitter two feet from the pinhole. This is an impossible distance for a lens, but it is workable with the pinhole. However, there is a limit, and this is perhaps within it. It would obviously be impossible to work at a distance of twelve inches from the subject; for which reason, a half-size head cannot be taken at a six-inch bellows extension, but will need at least twelve inches, leaving the distance of pinhole from subject still at two feet. As the extension to twelve inches quadruples the exposure time, it is plain that half- and full-sized heads are only possible under quite exceptional circumstances. For these reasons, the six-inch extension seems to be about the best working limit.

Apertures for Portraiture

The question of size of pinhole is a question of taste. Those who want clearness and detail will use a No. 3; lovers of considerable diffusion of focus will obtain their desire with No. 1; and the average educated taste will find satisfaction in using No. 2. Now, let us see how this will work out in the matter of exposure time. Take an outdoor study (light 15 seconds to color Wynne test-paper), Seed's 26X plate, bellows extension six inches; pinhole No. 1 equals six seconds; pinhole No. 2 equals twelve seconds; pinhole No. 3 equals twenty-four seconds. As these normal times may be halved and a good negative still secured by careful development, it is clear that the exposure time is no way prohibitory with a good sitter. A No. 1 pinhole at twelve inches bellows extension would permit of a half-sized in twenty-four seconds; which, though diffuse, would be quite satisfactory by reason of its size. So far as I know, the No. 1 pinhole has not been used or recommended by

previous writers; but the image produced by it is quite as well, nay, better defined than many new-school men are in the habit of lauding. (See Plate XVII.) These exposure times may be still further reduced by making use of strong sunlight. Thus, the lady with the white parasol (Plate XVIII) was taken in ten seconds. I believe it could have been reduced to five.

In pinhole portraiture the background becomes of considerable importance. It is not possible, as with the lens, to throw it out of focus; it is necessary, therefore, to see that it harmonizes. While this is sometimes an added difficulty, at others it is an advantage that the lens cannot be made to yield. Too little is made of the pictorial possibility of strong foreground groups, such as figures with beautiful settings, which have been the stock themes of many painters. One reason for this neglect is the difficulty of getting figures and distance into focus without using a very small stop, which means not only a very long exposure, but photographic hardness of detail. With the pinhole this difficulty does not exist — a decided advantage.

Pinhole Snap-Shots

After what has been said about portraiture and long exposures, it would seem to be futile to talk of instantaneous work with the pinhole; and when, some time ago, I mentioned the possibility of this being done, an eastern critic promptly fell foul of my statement, demonstrating on theoretical data how this thing was impossible. The only way to deal with the theorist is to kill him with a fact, and the accompanying illustration is my bullet (Plate XIX). This was taken on a windy day (as the line of the smoke demonstrates) with a No. 3 pinhole, mounted in front of a B. and L. shutter, working at one-eighth of a second. The definition of the houses is good, and the smoke is but little blurred by moving rapidly. However, any one may demonstrate the matter for himself. Let him use a fast plate, a No. 3, or if there is no intention of enlarging, a No. 2 hole, and camera extension not exceeding six inches; and if he then fare to the seashore or river or any other spot where the light is abundant, he will have no difficulty in getting pictures with exposures of one-fifth of a second or less.

Copying has been referred to by other writers as a legitimate field for pinhole work. I do not claim any advantage for it against the lens, but if a man has but a poor lens he can make better copies with a pinhole, for, so long as the planes of subject, pinhole and plate are kept parallel no distortion is possible, nor is the time excessive. If the sharpest possible copy is required, it will be necessary to use No. 5 hole. If a copy be made at the window on a bright day, say, when the Wynne test-paper colors in fifteen seconds, on a Seed 26X plate, and a bellows extension of six inches, we have $5 \times 6 = 30$, which would require a two-minute exposure. This presupposes a subject of normal color, such as a photograph not too deeply printed. A black-and-white print would require only a fourth of this time, or thirty seconds. I mention six inches as a convenient length of bellows extension, but if we accept the table of M. Combe, to be given later, the length of bellows extension ought to be regulated by the size of pinhole used in accordance with his observations. If the copy is to be the size of the original, the latter must also be placed six inches from the pinhole; if half the size, then at double the distance or twelve inches. When the original subject is unpleasantly harsh in its detail, the copy may be reduced to any degree of softness by using the larger sized pinhole. This is often a great advantage, not easily obtainable by the lens.

Enlarging with the Pinhole I have used the pinhole for making enlargements with quite satisfactory results. It is the simplest and cheapest of all methods. The sole requirements are a plain box, and a wooden support on which to place the negative or transparency. The following arrangement will be found to answer perfectly for all ordinary purposes: Obtain a light-tight wooden box, with a light-tight cover. It should be eight inches deep and equal to the dimensions of the greatest enlargement, say 11 x 14. Paint this inside with dead black stain and put the pinhole in the center of the bottom. This is the camera-box. Procure a second box six inches deep and of the dimensions of the largest negative, say, 5 x 7; remove the top and bot-

tom, and cut two slots at each hand, two and four inches from the bottom. (Fig. 8.) Now let us see how this simple apparatus is employed. We will suppose we are to make an enlarged negative. We follow the usual procedure and make a contact transparency, then place the dry - plate on which the enlargement is to be made in the center of the cover of the camera-box. Place the box on the cover ; put a piece of cardboard or other opaque substance over the pinhole and take the box out-of - doors, in the best possible light, sunlight if possible. Set the wooden support over the pinhole so that the latter is exactly central. This ought to have been done before using, and the correct situation marked and maintained by nailing three wooden beads on the camera - box. Now place the transparency on the support, remove the cover from the pinhole and make the exposure. Where we place the transparency on the support depends upon the enlargement we require. If we place it on top, six inches from the pinhole (pinhole being eight inches from plate), the enlargement will be one and

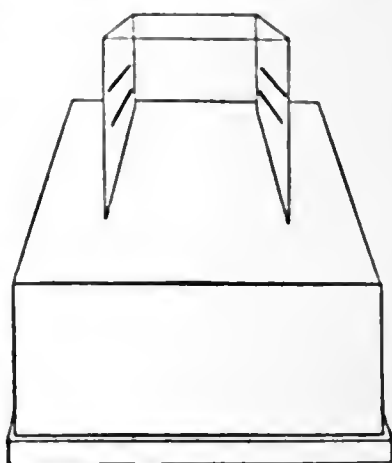


FIG. 8

one-half times. If we place it in the first slot, four inches from the pinhole, the magnification will be four diameters. To determine the exposure time, we have the fact that the depth of camera is eight inches and the pinhole No. 5 ; this gives $f/40$. If the light time by exposure meter were fifteen seconds and the plate a Seed 26X (Wynne Plate, speed 90) we should require three minutes' exposure for a normal subject. A fairly dense negative is equal to a normal subject when enlarging.

M. Combe, the French writer previously referred to, maintains that for each size of pinhole there is a definite camera extension which gives the maximum of sharpness.

Combe's
Table

According to his table, our numbers 3, 4, 5, which for this class of work are the only ones usable, require an extension and possess a covering power as here given:

NEEDLE	EXTENSION	COVERS PLATE
No. 3 (0.5 mm.)	12 in.	20 x 24 in.
No. 4 (0.37 mm.)	6 in.	10 x 12 in.
No. 5 (0.25 mm.)	3 in.	5 x 6 in.

For copying same size the bellows should have an extension double the above, and the object and sensitive surface be removed the same distance from the pinhole. For enlargements, add one to the ratio the desired enlargement bears to the original and therewith multiply the extension for the particular pinhole as given in the above table. Thus, to enlarge a picture three times with a No. 5 hole we should have $3 \times (3 + 1) = 12$ inches.

**Combining
Pinhole
and Lens** Concluding, I desire to speak briefly of a subject that has had very little consideration and yet is not without useful possibilities. I refer to combina-

tions of the pinhole with the lens. A moment's consideration will show that the interposition of a lens before or behind a pinhole will alter the direction of the rays, making them more or less divergent, without preventing their final convergence; in the case of using a *minus* lens, or when using a *plus* lens, substituting a lens image at the normal focus of the lens used for that having the characteristics of the pinhole image. If this is true, then the placing of a *minus* lens behind a pinhole ought to give us telephoto effects, and the use of a *plus* lens in front of a pinhole should give somewhat greater light intensity and better definition, without a loss of property of the infinite focus, which is so valuable in the pinhole.

**Pinhole and
Minus Lens** My first experiments were made with the *minus* lens, and so far as I know I am the first in this field. My results were published in *The Photogram* and in *Camera Craft*, and the following abstract from those papers gives the present status of my experiments. To take a photograph

with an apparatus in which the only lens employed is a *minus* one may at first sight appear an impossibility, but the results I have obtained demonstrate the opposite.

I have little special knowledge of optics, but it occurred to me that if the image formed by a pinhole were

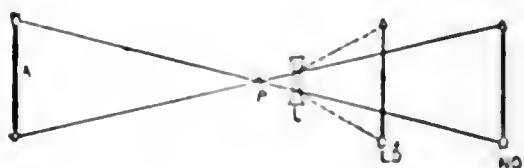
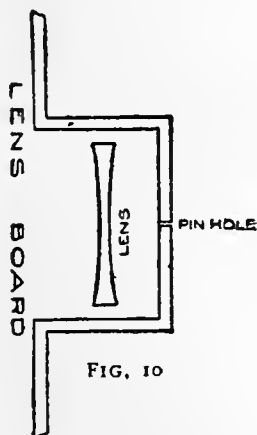


FIG. 9

passed through a *minus* lens the rays would necessarily suffer outward deflection and the image be correspondingly enlarged without extension of the camera, or would attain the same at a less extension. The idea is illustrated by the accompanying drawing, Fig. 9, where the image of the arrow *A* projected through the pinhole *P* would normally form a picture of the same size as the object at *ND*, but which after traversing the concave lens *L* undergoes such outward refraction as to form an image of the same size as the object at half the distance, as at *LD*. Necessarily, the outward displacement and consequent magnification would depend on the strength of the *minus* glass and its position in relation to the pinhole. This I presume could all be calculated, but I prefer to determine it by experiment. I put a contact transparency of a negative of myself in my daylight enlarging apparatus and substituted my set of pinholes for the lens. Using No. 1 pinhole, which is one millimeter in diameter, I got a well-defined image measuring from the hair-line to point of shirt-front four inches. Now placing a ten diopter *minus* lens half an inch behind the pinhole, the image on the screen immediately increased in size to five inches; on moving the lens farther back the image grew in size to seven and a half inches; beyond this I could not go, as the shadow of the lens was thrown across the image and spoiled it. I then tried stronger lenses, with the result shown in the following table:

Strength of lens	Size of pinhole image 4 inches	Size of pinhole image and lens $\frac{1}{2}$ -inch behind hole.	Size of pinhole image and lens 2 inches behind hole.
10 D	4 inches	5 inches	$7\frac{1}{2}$ inches
16 D	4 "	$5\frac{1}{4}$ "	$8\frac{1}{4}$ "
20 D	4 "	6 "	10 "

To bring the matter to a practical test I put a Seed's No. 26 plate on the easel and gave ten seconds' exposure, using a No. 3 pinhole (0.5 mm.). I then made another exposure with the ten diopter lens one inch behind the hole, giving forty seconds' exposure. A second experiment was made with a No. 4 pinhole (0.37 mm.) at exposures of twenty and eighty seconds. Prints from these negatives are before me as I write, and, except for sharper definition of the one made with the smaller pinhole, they are alike and demonstrate that by placing a minus lens behind a pinhole the image may be magnified without altering the length of the bellows. In other words, the principles of telephotography are applicable



to the pinhole as well as the lens. In my experiments I used an ordinary spectacle lens, and I noticed (what is not apparent in the enlarged head) that the image on the edges of the transparency plates showed inward curving, in fact the usual pincushioning distortion of a single lens. This could doubtless be corrected in the usual manner if found undesirable. To make practical use of this telephotic power in the field demands a contrivance whereby the minus lens can be moved behind the pinhole. I would suggest the

use of an ordinary telephoto mount; the barrel being short and the minus lens so arranged as to be capable of being adjusted at any distance ranging from immediately behind to two inches in the rear of the pinhole. This with a 16 D lens would double the size of the

image. Any one desiring a more simple but not so convenient an arrangement can mount the lens in a slot at the bottom of a small box having the pinhole in front and opening into the lens board behind, as suggested by Fig. 10 on page 549.

I shall experiment further along the lines here laid down, and expect to have more to say at some future time. Evidently we have here not only an optical novelty but a means of increasing the efficiency of the pinhole in narrow-angle work. The method does not seem to offer any gain in illumination, but the gain in stability is both great and important.

Pinhole and Plus Lens The same considerations that led me to seek and find a telephoto effect from the combination of a pinhole and a minus lens, point to the probability that a *plus* lens placed in front of a pinhole would result in more rays from the object entering the hole, with a consequent increase of the illumination and shortening of the exposure time. I have not had time to systematically work over this field, but I have done enough to know that these expectations are, in the main, justified. Since I started working on the subject, Dr. Trutat has published an article in the *Revue Suisse de Photographie* on the subject of the spectacle lens in photography, in which he suggests the correction of the lens by its combination with a pinhole. He states that a lens so stopped may be worked at half its normal focus without loss of definition. Before this idea can be made available for pinhole work, it will be necessary to determine the possible range in both directions, the distance in front of the pinhole that the lens should occupy. This will doubtless vary with the focus of the lens employed; the best foci for ordinary use; and lastly, the extent to which these factors modify, if at all, the essential qualities of the pinhole image. These points I am engaged in working out, and expect soon to be in a position to answer. In the meanwhile, I can give the reader an idea of the picture that results from such a combination. The accompanying illustration shows a scene taken with a pinhole and also with the same pinhole and a twelve-inch lens placed immediately in front of the lens; the camera extension

was six inches, or half the focus of the lens. [The difference between the two prints mentioned is so slight that it would not be evident after half-tone reproduction, hence we omit these illustrations.—EDITOR.]

I have now given a résumé of what I believe to be the most practical way of using the pinhole for serious photographic work. I have made no attempt to exhaust the subject, and have preferred to give my own experience rather than my reading. Much work is yet to be done, and what is wanted is earnest workers. To such I make a special plea for a careful consideration of the chapter on exposure time. I am daily more convinced that without the use of holes of standard size, progress is impossible, and that the factors I have given solve the difficulty of exposure, making it as accurate and simple as with the lens.

H. D'ARCY POWER, M.D.

BOOKS

Apart from occasional papers in the photographic journals here and abroad, the literature of pinhole photography is extremely meager. The paper by M. Combe, mentioned in the monograph as published in *Photography*, July 4, 1903, is a valuable contribution to the subject, but too lengthy for reproduction in its entirety. *The Photogram* for 1901 also contains an interesting series of papers dealing with pinhole work, and the *Transactions* of the Edinburgh Photographic Society, for June, 1905, give a helpful résumé of the experiences of Mr. A. P. Noble with a pinhole camera. The only manuals in English are:

Pinhole Photography (THE PHOTO-MINIATURE No. 27), a practical account of the uses of the pinhole, its manufacture and the making of a pinhole camera, with illustrations. By Rev. J. B. Thomson. 1901. 25 cents.

Stenopaic or Pinhole Photography. By F. W. Mills and A. C. Ponton, chiefly notable for its profusion of algebraic calculations. 1895. Price, 50 cents.

Notes and Comment

IMPORTANT NOTICE.—After exhausting every means at our disposal in an obstinate attempt to bring THE PHOTO-MINIATURE "on time" without breaking the consecutive order either in date or number, we have determined to cut the knot of the difficulty by omitting the January, February, March, April, May and June numbers. This enables us to date the present number July, bringing the little magazine up-to-date at a single stroke. Hereafter (D.V.) THE PHOTO-MINIATURE will be published and mailed on or before the first of the month for which it is dated. Some unusually interesting monographs are on hand or in preparation, and we fondly hope to add the touch of perfection to them by dating them with the actual month in which they are published.

This chiefly concerns the long-suffering subscriber, who has our profound sympathy in the vexatious delays of the past year—due to causes wholly beyond our control, wherein neither work nor wealth availed. Every subscription on our books has been advanced so that each subscriber will receive in due time all the numbers paid for by his subscription.



A novel prize competition is announced in the July number of *The Strand* magazine which may possibly appeal to some of our readers. Four costume portraits are reproduced in the magazine and a prize of \$500 will be divided equally between the sitter and the taker of the photograph which, in the opinion of the judges, most closely imitates any one of the four pictures shown. The second prize is \$150, and the third prize, \$100, divided in the same way. A second competition on the same lines, for child portraits, is to be

announced in the August number of the magazine. Readers will do well to look into *The Strand* for July and August.



Tank development is daily attracting more and more attention from busy photographers, both amateur and professional. During the last few weeks we have given all the leisure time we could find to experiments along this line, and hope to have a monograph on the subject in this series before the year is out. Meanwhile readers who would like to give tank development an intelligent trial will find the easiest way in the purchase of the Auto-Tank just introduced by G. Gennert, New York, and Gennert's Auto Developer. The Auto-Tank will develop at one time from six to eighteen plates, and the Auto Developer is a perfectly compounded solution which ensures absolute freedom from fog and successful results with the least possible trouble.



The London Photographic Salon, 1905 (13th year), will be held at the Royal Water Colour Society (5a Pall Mall, East, London, S. W.) from September 15 to October 21, 1905.

The aim of the Linked Ring is to exhibit only photographs displaying originality of conception, expressed in a pictorial manner. All the work of American photographers destined for the London Photographic Salon must be submitted to a Selection Committee, sitting in New York, and composed exclusively of American members of the Linked Ring, whose names are: C. Yarnall Abbott, A. L. Coburn, F. Holland Day, Mary Devens, W. B. Dyer, R. Eickemeyer, J. Frank Eugene, Gertrude Käsebier, Joseph T. Keiley, Margaret Russell, Eva Watson Schutze, Sarah C. Sears, Eduard J. Steichen, Alfred Stieglitz, Edmund Stirling, Clarence White.

The pictures approved by the American Selection Committee will be accepted for hanging without passing the London Jury. Pictures for this Committee must be addressed as follows: For the London Photographic

Salon, Mr. Alfred Stieglitz, care of Geo. F. Of, 3 East 28th Street, New York City, and must be delivered at that address, carriage prepaid, together with accompanying entry form or list by July 24. Rejected prints will be returned promptly at the expense of the exhibitor. Pictures that have already been exhibited in London will not be accepted.

Pictures entered in any other exhibition open in London at the same period are likewise unacceptable. On such pictures as are sold, a commission of 15 per cent will be charged by the Salon.

Prints must be separately framed. Each frame must bear name of exhibitor, number and title of picture, and price, if offered for sale. A corresponding record of particulars, on official entry form (or list where exhibitor is unable to obtain such form), must also be furnished.

While it is desirable that all entries should be sent framed, persons desiring to submit unframed prints may do so.

Such unframed prints must be so mounted as to protect them from injury, and be properly labeled with title, address, etc., to correspond to their entry form. Unframed prints accepted by the jury will be framed at the exhibitor's expense by Geo. F. Of, 3 East 28th Street, New York.

There will be no charge to exhibitors for the forwarding of exhibits from New York to London and their return to New York; the only forwarding charges to exhibitors being express charges from New York to home of said exhibitors. Signed: Joseph T. Keiley, for Alfred Stieglitz.



We have received announcement of the Second American Photographic Salon 1905-6 to be held at New York, Philadelphia, Washington, Pittsburg, Chicago, San Francisco, Portland, Minneapolis, Toronto and Boston under the auspices of the American Federation of Photographic Societies, with many distinguished patrons. In order to facilitate the judging of the exhibits this year, a National Preliminary Jury of pho-

tographers is announced, who will select about 1,000 frames to be acted upon by the Final Jury of eighteen prominent painters, as follows: Kenyon Cox, N.A.; W. M. Chase, N.A.; Fred W. Kost, A.N.A.; Robert Henri, S.A.A.; W. A. Coffin, A.N.A.; Alphonse Jongers, Will H. Low, N.A.; I. A. Josephi, John W. Alexander, N.A.; Irving R. Wiles, N.A.; Walter Clark, A.N.A.; Francis C. Jones, N.A.; Ben Foster, A.N.A.; Childe Hassam, A.N.A.; Dwight W. Tryon, N.A.; Geo. R. Barse, Jr., N.A.; Douglas Volk, N.A.; Henry Prellwitz, A.N.A.

In order to make the sending in of exhibits for the Salon easier for competitors residing at a distance, Local Juries are announced for most of the states and foreign countries, the addresses being given to which work may be sent. Another innovation is the announcement of Purchase Funds amounting to \$200, to be expended in the purchase of three selected exhibits, selections to be made by the Final Jury of Painters. The announcement of the Salon is of too great length for the space at our disposal here, but copies can be obtained by intending exhibitors on application to the Secretary, W. T. Knox, 279 Washington Street, New York City. Great efforts will be made to ensure the success of this Salon, and all pictorialists are cordially invited to communicate with the Federation with a view to exhibiting their work.



The new pigment paper, Colorprint, giving prints in the colors of nature from ordinary landscape negatives, has met with even greater success than the manufacturers anticipated, and their capacity for filling orders is being severely taxed. Readers who have not yet given Colorprint a trial should send one dollar to Howe & Hall, 90 Lake street, Chicago, Ill., for the 4 x 5 outfit, which includes a sample print, supply of tissues and transfer paper with the sensitizer.



The success of the new Auto Graflex Camera made by the Folmer & Schwing Manufacturing Company,

New York, is one of the most gratifying signs of the times. This camera may fairly be said to represent the high-water mark in camera construction, combining the best construction with the greatest efficiency in manipulation. The new Auto Graflex is for $3\frac{1}{4} \times 4\frac{1}{4}$ photographs and is fitted with a simplified focal plane shutter, permitting time-exposures of any duration and instantaneous exposures up to one-one-thousandth of a second. The image is shown full size and right side up at the instant of exposure, which ensures complete accuracy and satisfaction in working. A special booklet can be had on request from the manufacturers.



Mr. William Gamble, editor of *Penrose's Process Year Book* and *Process Work*, London, returned to England a few days ago, after a flying visit to this country, taking in New York, Philadelphia, Chicago and the Photo-Engravers' Convention at Buffalo as part of his trip. Few men are so widely known or so highly esteemed among process workers the world over as William Gamble, and his short stay among us was, therefore, an event of unusual interest.

While in New York Mr. Gamble gave an address on "The Latest European Process Methods" before the metropolitan section of the Photo-Engravers' Union at Beethoven Hall. The affair, arranged through the good offices of Mr. Stephen H. Horgan, of the *Tribune*, brought together most of the prominent process men of the city and a big crowd of shop-workers. Among those present we noted Geo. W. Dunn and A. C. Austin, of *The Illustrator*; Henry L. Bullen, of the United Printing Machinery Co.; Frederic E. Ives; O. G. Mason, W. I. and H. W. Scandlin; George Gill; H. L. Walker and Ed. Epstein, of the Walker Engraving Co.

It is needless to say that Mr. Gamble's remarks were followed with enthusiastic interest. During his address the lecturer frankly stated his opinion that our American workers are hardly abreast of the times in their craft, this being due, he thought, to false confidence and a lack of reading and technical information among the workers in the shops. With this introduction Mr.

Gamble proceeded to explain various European methods, illustrating his descriptions by handing around specimens of the methods under discussion. Among the exhibits shown was the Penrose Process Camera, a magnificent bit of apparatus with all the most recent movements and improvements for three-color work, etc. A few reminiscences of process work in earlier days told by Mr. Horgan and Mr. Ives closed the meeting.

The complete text of Mr. Gamble's lecture is to be published in the July issue of *The Inland Printer* and should be seen by everyone interested in the graphic arts. On the eve of Mr. Gamble's departure an informal farewell dinner was given by Mr. Henry L. Bullen at the Hotel Astor, the company including many well-known process men and journalists.




The Technolexicon of the Society of German Engineers (short report on the state of work June, 1905).—In the compilation of this universal technical dictionary for translation purposes (in the languages English, German and French), commenced in 1901, about 2,000 firms and individual collaborators at home and abroad are assisting at present. Up to now, 2,700,000 word-cards have been collected. To these will be added the hundred thousands of cards that will result from the working out of the original contributions not yet taken in hand. The contributions have been called in since December, 1904, and most of them have already come in (up to June, 1905: 1480).

The editor-in-chief will be pleased to give any further information wanted. Address: Technolexicon, Dr. Hubert Jansen, Berlin (NW. 7), Dorotheenstrasse 49.




An attractive catalogue describing and illustrating the Century Portrait Cameras and Studio Outfits has just come to hand from the Century Camera Co., Rochester, N. Y. These instruments embody many new and improved features of which portraitists should be informed.

The Wager Exposure Scale, for the easy calculation of photographic exposures under varying conditions, has already been noticed and commended in these pages. Readers who have experienced difficulty in finding this handy little convenience in the market should note that it is now manufactured by the John Howard Herrick Company, 7 Clay Street, Baltimore. This firm makes a specialty of computing scales for many purposes and, among other novelties, has just introduced the Wager Definition Scale—a pocket-card giving, at a glance, the longest allowable exposure for moving objects at different distances. Such a scale has long been needed, and hand-camera workers will doubtless welcome its appearance.



Obifo is a new chemical product which claims to do away with the dark-room and the necessity for developing machines, permitting plates or films to be loaded or developed by subdued gas or daylight without any fog or veil. It is also said to increase the latitude of the plate used to produce better color values, etc. We have not as yet found opportunity to give Obifo a practical test, but its claims make interesting reading and a sample tin (sufficient for 8 ounces of solution) can be had for 30 cents. The Prindle Process Company, 74 Broad Street, Boston, Mass.



Some weeks ago we had to undertake the copying of upwards of a hundred illustrations in black and white and colors for a lantern lecture. The work had to be done at odd hours "when the lamps were lighted," and focusing was not an easy matter until we availed ourselves of the Cooke Focusing Magnifier, when all the difficulties vanished. Those who have work to do where critical focusing is essential should equip themselves with this admirable little helper, which saves time and temper and makes focusing an easy instead of a wearisome task. It can be had for a nominal sum from Taylor, Taylor & Hobson Ltd., St. James Building, New York, and will last a lifetime.

Second Postscript to The Photo-Miniature No. 66

THE WALLACE METHOD IN PRACTICE

I was formerly a believer in the old-time theories of control in development by means of modification of the constituents of the developer, and was confident that within limits almost any change might be wrought in the negative by skilful manipulation in the dark-room. Later, I adopted the factorial system, based on a multiple of the time required for the first appearance of the image. This I found was a great step in the direction of that so much coveted goal, the ability to produce "a good negative every time," success now depending largely upon correctness of exposure. But it still left much to be desired, as it did not produce the best results obtainable from plates which had been over- or under-exposed, and in the development of these I still clung to the tentative methods. Besides, it was a laborious and slow process to develop one plate at a time, while to develop several plates simultaneously, although quite practicable, introduced such complications that under- and over-exposures, requiring special treatment, were likely to be neglected.

When Mr. Watkins stated in his letter, published in THE PHOTO-MINIATURE No. 66, that he often developed a number of plates in a tray together, taking the average time of appearance as the basis upon which to calculate the time of development for all, I at first accepted the idea with considerable incredulity as to the result. Perhaps it was because of this prejudice that my first attempts did not convince me of its practi-

cability, but further experiments proved to me conclusively that it was not only practicable but that it was really a great advance over the former method of calculating the time of development from the time of appearance of the image for each separate negative, as it gave much better results with both over- and under-exposure, and the amount of contrast desired in plates receiving uncertain exposures could be secured with much greater certainty. It was, in fact, to all intents and purposes, a modification of the Hurter and Driffield principle, as set forth in *THE PHOTO-MINIATURE* No. 56.

I have now become a thorough Hurter and Driffield convert, and since the publication in *THE PHOTO-MINIATURE* No. 66 of the Wallace adaptation of the Hurter and Driffield system—a still further step in the direction of simplification and in certainty of results—my enthusiasm for it is unbounded. I have given the method the most severe tests, including snow and water scenes, and am convinced that if a printable negative can at all be produced from a plate receiving a given exposure, a like result under similar conditions can be obtained by the new method.

If there is one thing more than another that tests one's skill in development, or one in which the advocates of tentative development take the greatest pride in their ability to soften contrasts and produce natural gradations, it is in the production of a good negative from a flashlight exposure. One of the first tests I made of the Wallace developing formula and time and temperature table was, therefore, with a plate exposed by flashlight. Reproduced as one of the illustrations herein. The subject was one with contrasts ranging from pure white in the writing paper and in the dress of the little girl, to the dark background and shadows and black of the ink bottle and deeper shadows. No reflector was used, the lighting was well from one side and the plate was not color-sensitive. Yet in the print the scale of tones is as good as could be expected from a flashlight exposure. There are no harsh outlines, the rendering of the flesh tints is good, there is detail in the whites, transparency in the shadows, and some atmos-

phere. The negative was developed to the Wallace factor 5. The print was made on platinum paper.

However, all this is digressing, as I set out to give an account of the manner in which I have used the Wallace factor. Given a certain thing to do, or a certain result to be obtained, even if the scheme to be followed in doing it is well outlined, no two persons will follow exactly the same plan in accomplishing it, though the ends attained may be identical. Little things along the way may be immaterial, and yet it is the sum of these little things which may make the difference between doing things systematically and with certainty of result, or of going about them without system and with a new set of awkward things to contend with or mistakes to encounter every time they are done. One man will do a thing his way and the result be very satisfactory. Another will accomplish the same end equally well, but in doing so adopts many little expedients of his own along the way; while a third will work along almost forever and never arrive at anything like a well-planned system or obtain anything like uniformity in results. I therefore give the plan I have followed in using the Wallace adaptation of the Hurter and Driffield principle. It may or may not appeal to every reader as being wholly adapted to his particular needs, but perhaps it may contain some suggestion which will be of help to him in reducing his own methods to an absolute system. What I shall say will be in no way theoretical, but will have reference to the purely mechanical function of developing the negative, assuming that the reader is already familiar with the contents of *THE PHOTO-MINIATURE* Nos. 56 and 66, to which he is referred.

To begin, I am taking it for granted that the reader, like myself, is an amateur, and that he has chosen the family bathroom as the location of his dark-room. He no doubt already has in use across the bathtub some suitable platform or arrangement for supporting his trays and lamp during development. The exact arrangement of this is immaterial, but it may consist of simply a plain wide board, say 18 or 20 inches wide, and of sufficient length to reach well across the bathtub, and should have blocks fastened in some way to

the under side so that it cannot easily slip off and drop into the tub. As I am obliged to do most of my own work at night, I use a large kerosene oil ruby lamp for the purposes of illumination. This lamp has a side as well as a front light, and is placed on the farther end of the platform and next to the wall. Attached to one side of the lamp, and close to the side light, is fixed a small clock, suspended from a wire hook attached to one of the rings on the top of the lamp, the object being to always have the dial of the clock well in the light, and to avoid the possibility of its being accidentally upset or pushed off the platform by moving the lamp or other articles in the dim light.

In front of the lamp and on the near end of the platform is placed a developing tray, one just large enough to accommodate four plates—say an 8 x 10 tray for four 4 x 5 plates. Between the tray and the lamp a large sheet of cardboard, of sufficient size to cover the tray, is stood on edge and supported by the hood of the lamp, to shield the plates from the light while they are being taken from the plate-holders and put into the tray preparatory to development. A wide camel's-hair brush is also close at hand, while down to one side and in the bottom of the bathtub is placed a grooved fixing-box containing the fixing-bath. Attached to a long string and suspended from a nail on the wall is hung a typewritten copy of the Wallace time and temperature table mounted on a large card, so that it may be brought to the light and consulted in case it should be desired to alter the factor at any time, and which falls to its place and cannot easily become soiled and can always be found in the dark. A thermometer is also hung on the wall close by and away from the lamp.*

And now, our developer having been previously prepared, the temperature noted and our factor determined upon, we will proceed with the operation of development.

First, take four plates from the holders and place them in the tray, keeping them shielded from the light by the cardboard standing on edge as above described.

* Two amateurs of our acquaintance have had years of quiet satisfaction in a very similar bathtub dark-room arrangement, so that we commend Mr. Little's plan as wholly practical to the apartment-dweller in large towns.—EDITOR,

Replace each slide in the plateholder as the plates are taken therefrom. Put the developer on the plates in the usual way, giving the tray a quick tilting motion but not sufficiently violent to cause the plates to slide one over another. Then go over the plates very quickly with the camel's-hair brush to break up any air-bells which may have formed, so that the developer may work evenly over all the plates from the start. This is important, as the Wallace formula, being somewhat concentrated, works rather quickly, and to avoid streaks the developer should act simultaneously upon all parts of the plates.

The cardboard should now be laid over the tray and the tray rocked occasionally until development is completed. As only sufficient developer is required to well over the plates, the tray should be kept flat on the platform during development, to insure an even flow of the developer over the plates at all times.

Allow development to proceed until the factor time has elapsed, then place the palm of the left hand in the center of the tray and over the corners of the four plates where they intersect, so as to hold the plates firmly in place (being careful that the nails do not touch the film), and pour off the developer. Then, still holding the plates in place, run the tray full of cold water, pour off and refill once or twice.

The tray may now be placed back on the platform and the plates leisurely removed, more thoroughly rinsed and placed in the fixing-bath. Development may continue slowly during this operation from the small amount of developer still remaining in the film, but its action will be so slight as to not matter materially and will adjust itself with experience in choosing the proper development factor.

It is better to have two or three trays for development purposes, provided the rinsing water materially differs in temperature from the temperature of the developer, so that they may be used alternately and regain the normal temperature before they are again used. Before proceeding to place the next four plates in the tray, the tray should be well drained of all the surplus water remaining in it, as otherwise it might reach the film of

the plates before the developer is poured on and cause streaks.

Having things thus reduced to a thoroughly systematic basis, there is no danger of the light fogging the plates, or of scratching the film, and twelve plates having received within reasonable limits proper exposures should yield a dozen good negatives, the printing contrasts of which may be predetermined at will. At any rate, if the resulting negatives are not satisfactory after this treatment, the photographer can rest assured that by no other means could they have been saved.

The process I have tried to outline is difficult to put clearly in words, but is ridiculously simple in practice. I might also observe that the precautions I have mentioned as necessary are not such as are peculiar to this particular method of development, but obtain equally with any other system or method of development.

J. W. LITTLE.





THE MAJESTIC MAIN
F. J. Mortimer

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

AUGUST, 1905

Number 71

Marine and Surf Photography

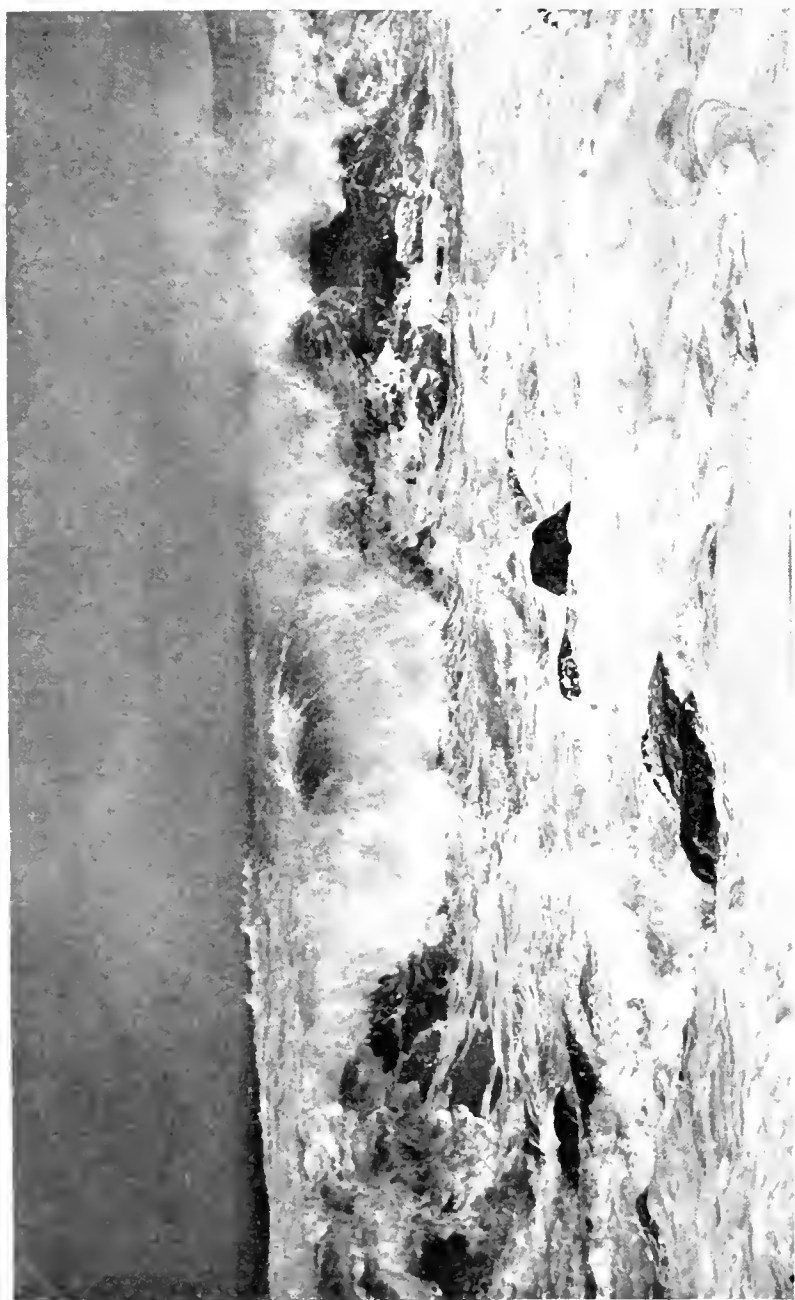
It is passing strange that we photographers give so little time and thought to the sea. We can count on the fingers all the really good photographic pictures of the sea which have come our way in twenty years. And yet, in what other field so accessible can we find so much beauty, so much variety of form and light and shade, or so many phases of action as are presented by the sea? Poets have striven in vain to give voice to its indescribable fascination; painters have done their best in a hundred years to express some of its infinitely varied moods, its ever-changing aspects, its bewildering glories in every change of wind, and light, and tide. Why should photography stand aloof? Is it not reasonable to suppose that the lens and the sensitive plate may possess peculiarly favorable capacities for the telling of the story of the sea?

It may be that the hosts of those who carry the camera are waiting for a leader, some one who can show them the possibilities of this comparatively unknown field of work. Here we have the mission of this number of THE PHOTO-MINIATURE. It has long been our desire to publish a little book about the sea and how to photograph it. Number 28 of this series, *Seashore Photography*, was an introduction to the subject. In this number, thanks to Mr. Mortimer and Mr. McCorkle, we are able to offer a guide to the marine photographer which cannot fail to lead him into the way of success. Everything

in the following pages comes direct and plain-spoken from actual experience in the face of innumerable difficulties. With the possible exception of a few of Mr. Worsley-Bennison's pictures, the illustrations in this issue of *THE PHOTO-MINIATURE* include some of the finest pictures of the sea yet published. Do we say too much in our enthusiasm? At any rate, we offer what we have with unbounded pleasure.—EDITOR.

It is one thing to photograph a given subject such as breaking waves. To tell how it was done, so that others may do it, is quite another story. There is probably no more difficult field within the entire range of applied photography than that I propose dealing with here, and, at the best, success can follow only after considerable experience. The photographer, accustomed to the milder delights of landscape and river scenery, portraiture, architectural and still-life studies, will soon find out for himself that the conditions which govern seascape and wave photography are altogether different to what he has been accustomed, and that old ocean's rollers will not sit up nicely to be photographed when required; while any endeavor to emulate a certain historical personage—Canute, to wit—who, it will doubtless be remembered, ordered the waves to stand still, will probably meet with the same measure of success that attended the efforts of that enterprising monarch. In other words, the photographer will get extremely, if not unpleasantly wet, and it will depend largely on the temperament and perseverance of the individual whether the process is periodically repeated.

Doubtless the readers of *THE PHOTO-MINIATURE* have noted the small number of seascapes at the photographic exhibitions as compared with landscapes and other open-air subjects. Unless I am mistaken, this dearth of sea pictures points more to difficulties in the way of obtaining them than to lack of initiative. In most instances, however, it is to be feared that most photographs of breaking waves will not be much beyond a record of opportunities taken advantage of, although circumstances sometimes admit of a personal interpretation being given to the picture.



IN THE HEIGHT OF THE STORM

F. J. Mortimer

**The Appeal
to the Eye**

The painter may carry away in his mind impressions of the wild scene, and later try to interpret them on his canvas, but the camerist is bound to a great extent by the restrictions of his apparatus. True, he may in a measure modify his picture by judicious after-treatment to more closely render the effect he observed, but, still, he is primarily bound by what his lens, shutter and plate will give him.

There is an outcry often heard nowadays against realism in photography, but to my mind no subject lends itself more for representations as it actually presents itself, than the angry sea. The faithful portrayal of such a "live" subject—as far as it is possible—surely leaves scope enough for the liveliest imagination to have free play.

Pictorial art is regarded by many as the idealization of Nature seen through the temperament of the artist; but surely Nature is beautiful enough at times to be reported verbatim, and the transcript remain a thing of beauty to stir the imagination in others. Beautiful natural forms portrayed as nearly as possible as they appear to the eye (and where shall we find more beautiful forms than in breaking waves?)—by straightforward photography maybe, and expressing an impression of the majesty and beauty, strength or tenderness which they possess by right, should appeal to every unsophisticated lover of nature and remain a lasting joy.

**Truth and
Beauty**

Let us, therefore, seek to find what difficulties present themselves in the correct representation of this fascinating subject, and what means are at hand toward surmounting them.

The first aim should be to secure a truthful rendering of the actual scene of action, endeavoring, if possible, to catch the picture at the right moment, when the composition has assumed its most likely correlation of parts. A quick eye is essential, but a faithful rendering can never fail to please and touch a sympathetic chord in every beholder for whom the sea has any attraction.

Nature is truth. Some truths are ugly, perhaps, just as Nature is not always beautiful or at her best, herein



A SPRING STORM
F. J. Mortimer

affording the artist temperament opportunities for selection. Of course I am not upholding photography of the sea in such a way that it presents the appearance of being frozen in grotesque designs, nor yet so full of movement as to suggest a badly smeared water-color. There is a happy mean, and it is this that should be striven for, although it is to be feared that the perfect wave picture has yet to be taken. The general rule, however, is to obtain the minimum of movement consistent with the maximum of exposure. Anything less will result in what appears to the *blatant* critic's eye as "frozen milk breaking over coal-heaps."

Scale The great trouble in all pictures of
a Difficulty big waves, whether at sea or breaking
 among rocks, is the lack of scale. Unless the locality is known and recognized, the average wave picture conveys but little more idea of the immense volume of water at work than a ripple in a puddle.

The only way to carry conviction is to photograph the same scene later in calm weather, showing the same rock formation, but with a man or boat in juxtaposition to convey the idea of the relative scale of the wave in the storm picture. It is, of course, virtually impossible for man or boat to appear during the actual storm, although occasional bits of wreckage and sometimes a belated bird may be happily caught, but the odds are greatly against such a thing happening when wanted. Much can be done, however, by judicious trimming of the print, and by keeping the camera low at the time of making the exposure.

Personal The wave photographer must be
Equipment equipped with a certain amount of recklessness, and have not too much regard for occasional bruises and broken apparatus—smashed by too impetuous an introduction to the slippery rocks, and very frequent drenchings. Where a particularly dangerous part of the coast is to be negotiated—and I have found by the usual perverseness of things that the finest effects are generally to be found amongst the most treacherous rocks—a companion and a stout rope are essentials. Once one loses one's foothold by the inrush

The small
photograph
shows the
scale—see
figure of man
on top of rock



Waves breaking over Peninis Head, Scilly Isles, Cornwall
F. J. Mortimer

of a mighty roller, the underwash and following waves are likely to settle the question for good and all unless the rope around the waist is held pretty firmly by the aforesaid companion. Oilskins and sea-boots are also very necessary. For getting about quickly, I can suggest no better costume than oilskin trousers, short coat, and sou'wester, worn over a very light flannel outfit, as the oilskins retain the heat in a most uncomfortable fashion. In fact, on days that have promised to be hot I have many a time worn the "oilers" over pajamas only, and sallied forth so clad, feeling all the better for it during the day. At all events, no clothes that are likely to spoil by wet or rough



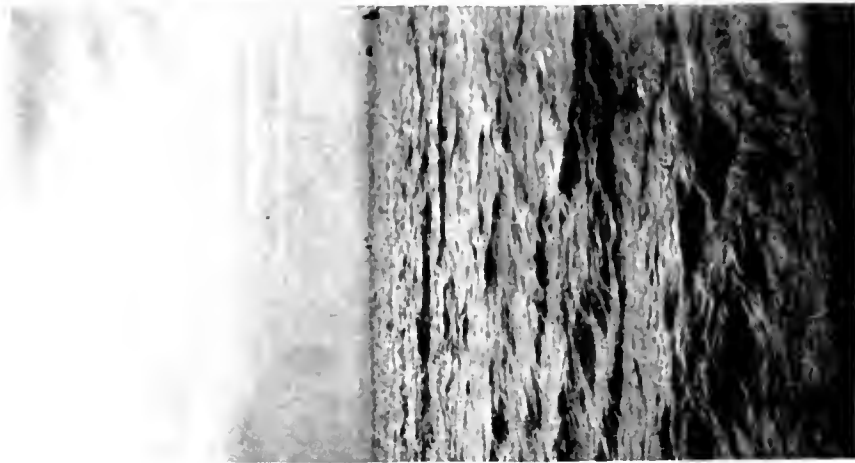
Mr. Mortimer at work

usage should be worn, and the ordinary mackintosh will be found not only useless, but a positive hindrance.

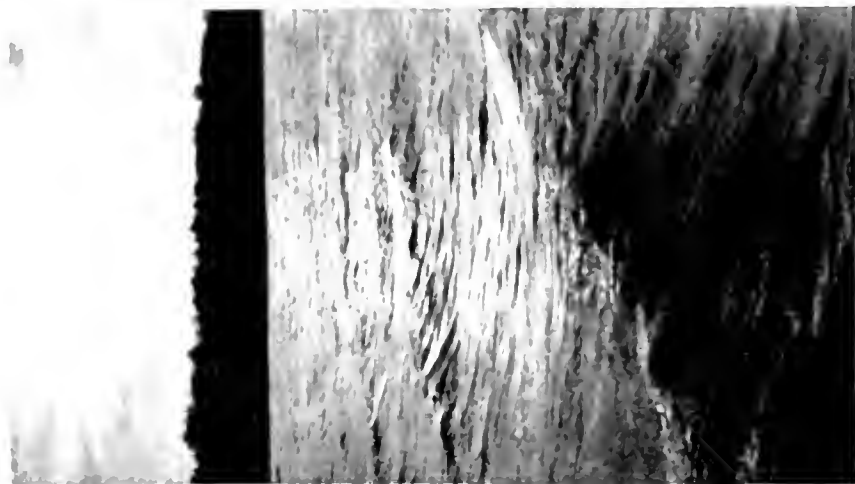
Footwear and Foothold The question of suitable boots is also worthy of serious consideration. Wellington or thigh boots should certainly be worn. After careful trial of plain leather soles, leather soles and rubber heels, all rubber, and leather soles and heels with projecting iron nails—somewhat similar to those affected by mountaineers—I unhesitatingly plump in favor of the last named. They not only afford a better hold on slimy rocks than anything I have tried, but once the initial strangeness and somewhat clumsy feeling has worn off, their very stability helps the wearer to become sure-footed quickly.

Study of Wave Forms A careful study of wave formation will prove instructive and interesting, and will repay a day spent in observation. The vast masses of water that constitute deep sea waves, to be met with only far out in the ocean, are as different in formation and grandness to the choppy waves seen at a harbor mouth, as the violent breakers among rocks are different from beach waves on flat ground. It has been incontestably proved that unless the water is broken, i. e., the wave turns and breaks into foam or the crest is blown off into scud—waves at sea are but a continuous undulating motion more or less violent, which leaves the body of water itself stationary. This can easily be seen by observing floating wreckage or weeds, which, unless shifted by tides—in which case the entire body of water moves slowly in one direction, and as slowly back again—remain in practically the same position for days together, although waves are apparently racing by at a great rate.

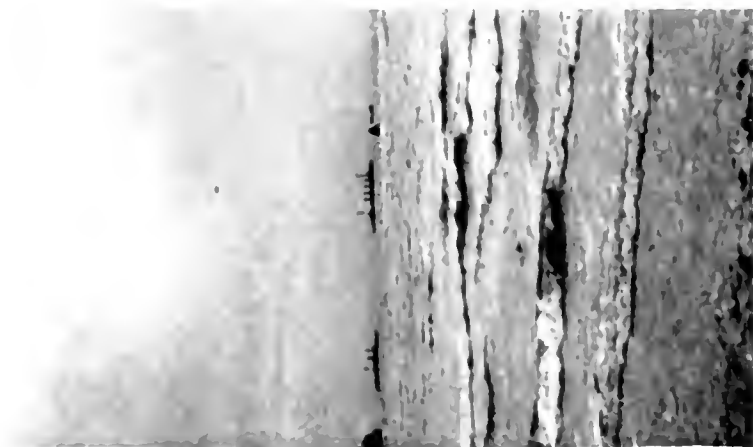
It will be observed after a time that **Big Rollers** the big rollers follow a regular sequence, and, although it will be found that waves bigger and fiercer than their fellows appear at fairly regular intervals, it will be more readily seen that they usually travel in sets of three,—that, after a lull in the turmoil, three giants will come blustering in, one after the other, and rend themselves on the rocks. Do not be led into a sense of false security, especially when the



Waves at Harbor Mouth



Beach waves—deep water



Beach waves—shallow water

THREE PHOTOGRAPHS OF WAVES, FOR COMPARISON

tide is rising, by venturing too far out, feeling sure from observation that no wave has yet reached the spot whereon you stand. It will come when you least expect it and are most unprepared, and its two followers will probably completely satisfy your craving for big waves—for that day at least.

Vigilance After a time, however, if a vigilant
Essential eye is kept on the watch, the big fellows can be seen "making up" far at sea, especially if there is a hidden reef or submerged rocks off the coast. A wicked, sinuous line of foam is seen afar off, appearing and disappearing amidst the heaving waters. It gets nearer, darts hither and thither, and you see the water itself is now on the move and gathering way. A second line, probably broader and higher, is seen following, and then a third appears. The foremost roller seems to gobble up all the smaller waves it overtakes, and gathers them in a greedy embrace, stimulating its own might and adding to its own volume continually, until, with an appalling shock and roar like thunder, it hurls itself—apparently irresistible—in tumultuous abandon on the grim rocks, which seem to fairly quiver under the impact. It means destruction absolute to anything less than granite, so keep a respectful distance. Sometimes the second or third follower, impatient perhaps at its place in the race for shore, strides forward and overtakes the foaming terror in white that hastened in front. When this is seen about to happen—and the line of demarcation between the big rollers is usually so distinct that it can be observed distinctly—run for your life. The two, or perchance three mighty rollers, terrifying and far-reaching enough individually, when combined into a huge advancing wall of solid angry water, gathering impetus with every second, is a sight to strike dismay to the stoutest heart and lend wings to the heaviest pair of sea-boots.

It is implacable and pitiless, and the force with which it dashes thousands of tons of water onto the very spot you occupied, high and dry, a few minutes before, cannot be computed, but affords much material for thought. In such circumstances, discretion is better than valor, and foolhardiness is all the word implies.

How Waves Break In a series of breaking waves from a given direction, it will be noted that they do not all break at the same distance from the shore. Some are spent before they reach the rocks, and dash on and over them in a milky seething mass of spume. Others break too late, and, striking the rocks, scatter in the air in all directions.

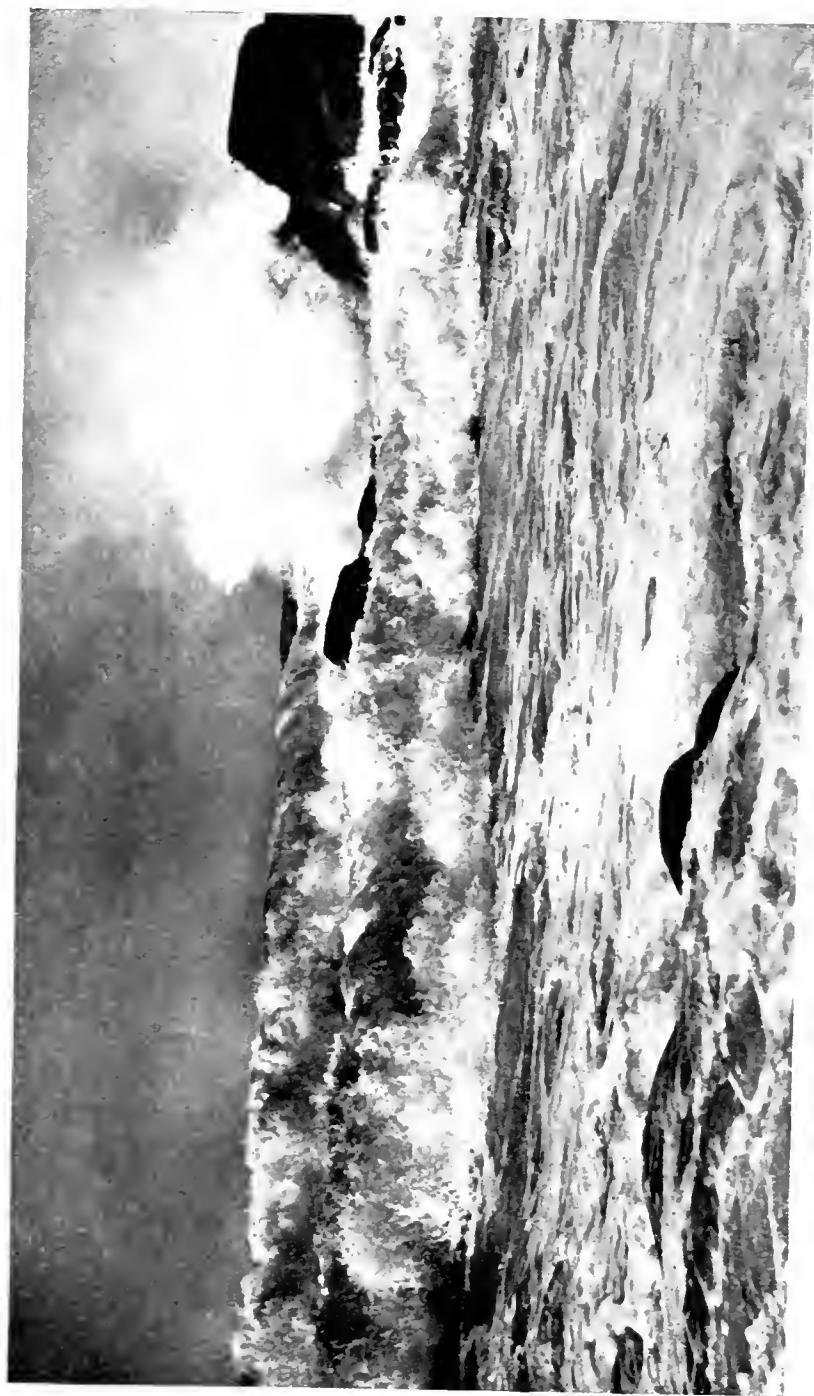
It can, in fact, after a time, be seen how each wave will behave as it approaches the shore, and the roller that usually makes the best picture is the one that comes up hat in hand, so to speak, sleek and well fed, bows politely, and at the right moment, goes spinning up and over the obstructing rocks in a graceful curve that hovers in the air for a period, and then vanishes in wreaths of beautiful spray.

Two Critical Points Possibly the most difficult phase of the breaking wave to catch is just when it has turned and presents a fulsome shiny curved back, teeming with life and motion, before crashing into shapeless foam; and the other is to get below the crest of the wave and catch the shimmering glint of beautiful green light that flashes in the concave inturn of the mass of water just before the crest curls over.

In this case, only a wave huge and towering can possibly give the effect with any realism, and the danger is considerable; but I do not think it impossible of achievement, although it means a severe drenching for the photographer in any case.

Choice of Locality When the locality has been selected for the purpose of photographing wave subjects, the most characteristic and telling view must be chosen—that which presents the leading features and most harmonious lines.

In sea-coast pictures there is much beauty and grandeur. Among the most striking features are the wild and broken cliffs which distinguish certain coasts; and where portions of these stand forth from the line of sea-wall, rugged, isolated and beaten by the tempestuous ocean, there we find subjects in abundance worthy of the most skilful treatment by the photographer with pictorial aspirations.



TWIN ROLLERS
F. J. Mortimer

Breakers and surf are the result of the Wind and Surf upper part of the wave being urged on by wind or storms, while the lower part is obstructed by rock, sand, weeds or adverse currents. This, of course, applies to the mass of water itself. The spray—which looks almost solid at times, and is often the most beautiful part of the wave—is carried by the wind and its own inertia to greater heights still, and proves the worst obstacle to be overcome when taking photographs among the breakers.

The Destructive Spray When the weather is very tempestuous and the surface of the water is literally blown off, this spray (called also scud water and spin-drift) is carried a great distance in the form of a mist-like rain, drenching everything with which it comes in contact. Woe betide the lens exposed to it for more than the fraction of a second, or the nicely polished brass-bound camera. It seeks out every corner, and a complete overhaul of apparatus is necessary as soon as possible.

Heavy Rollers without Wind Fine wave studies, however, can often be taken on windless sunny days, when a strong ground sea is running. The ground sea, usually in the form of mighty rollers which dash impotently against the stubborn rocks, is at the time the only indication that reaches the land of a storm active far at sea.

Observation and Warning Before attempting to photograph waves breaking onto rocks, the moving mass of water should be carefully studied for a time, until the character of the advancing wave can be gauged to a nicety and its point of breaking foretold. There is no doubt that an extra big wave recurs at more or less regular intervals, and the interval becomes more certain when the rollers advance from a settled direction—wind blowing inshore and tide rising. It will usually be found, however, that if there is a cross-current, or if the rocks against which the waves are dashing are on a jutting headland, the breakers occur first from one direction and then from another a point or two to the right or left. They approach the rocks and break alternately, and it will be noticed that those from, say, the



1. Storm from the Atlantic
2. Ground sea after a storm

3. Full tide
4. Low tide

Four views from the same standpoint, under different conditions of light and tide. F. J. Mortimer

right, gain a trifle, in point of time, on those from the left; and the extra big breaker (the one we are waiting for) happens when these two advancing masses of water meet and break simultaneously. From careful observation, this procedure on the part of the waves seems more regular when the tide is flowing. A note of warning is here necessary; never take up a position on a desirable spot, even though the most tempting composition of falling water and rock presents itself from that standpoint, when the tide is flowing—i. e., rising—unless an absolutely reliable and easy line of retreat is assured, or disaster is courted.

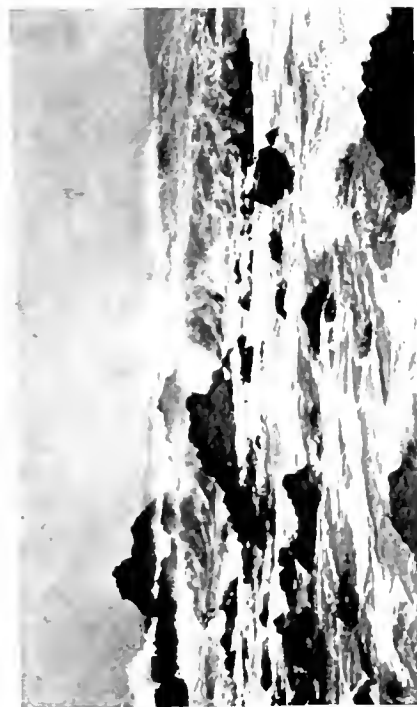
**The Moment
of Exposure**

As regards the actual moment of exposure, it will be found that in every wave form, when it strikes amongst rocks, there is an instant when the mass of water is at its maximum height and remains stationary, suspended in mid-air. It is but an instant indeed, but that is the moment the exposure should be made. It may occur just before it strikes the obstacle, or just after, but it will usually be found that if this instant is watched for and the exposure then made, far finer results will be the rule than with indiscriminate "potting" at the rushing water at any other time. Of course, it is not often that only one wave form is in the composition at a time. There may be, and usually are, several; but one will, or ought to, predominate, and this is the one to watch. The shutter speed should be regulated accordingly, to make the most of the others also, and of the flying spray. This brings us to the question of apparatus and the most advantageous methods of use.

**Exposure
Shutters
and Lenses**

In wave photography, shutters and exposure require much more careful consideration than the lens itself.

It will usually be found that most wave subjects, like all seascapes, are very actinic, and the lens will bear considerable stopping down, thus discounting to a great extent the powers of a high-class anastigmat. In fact, it will be found, except under exceptional conditions, that an ordinary good R. R. Lens is quite sufficient for the work, and the loss not so poignant when the unlucky breaker arrives that



1. Low tide
2. Half tide

3. Three-quarters tide
4. Full high tide

Four views from the same standpoint, showing different states of the tide. F. J. Mortimer

smashes up the outfit. The subject itself is so varied that foreground, focal-plane, and ordinary curtain shutters will all be found useful. Shun metal and diaphragmatic shutters for obvious reasons. The foreground shutter will probably score when dark rocks in the foreground need extra exposure, while the focal-plane and ordinary roller-blind before-lens shutters are generally useful for most wave pictures.

**When the
Focal - Plane
Gives
Advantage**

The focal-plane scores distinctly, however, when the light is bad, owing to its high efficiency. A comparatively smaller stop can be used with this shutter with approximately the same exposure given by the before-lens variety, and $\frac{1}{30}$ to $\frac{1}{130}$ will be found to cover the limits of shutter speed for nearly all wave work, using a fairly fast plate, say 200 H and D, and $f/16$. It should be borne in mind that in practice the focal-plane shutter admits about three times the amount of light with a given exposure that the before-lens shutter does with the same exposure. Thus, the focal-plane shutter working at $\frac{1}{90}$ will give the same result, as regards rendering of movement, as the before-lens shutter at $\frac{1}{30}$, but the plate will have had an exposure to light equal to that given by the other shutter working at $\frac{1}{30}$. In all cases the front of the lens must be protected from flying spray, either by a cap to be removed the instant before the focal-plane shutter is released, or by the before-lens shutter itself.

The ideal camera for the work would be a box magazine camera—absolutely waterproof, and with no projections whatever beyond, say, the shutter release, focusing screw and view-finder. This last, whether of the direct vision or reflex kind, should be independent of the camera and merely fixed to it for use. The view-finder apertures in the average box camera would be bound to let in the wet. The camera should have a *reliable* focusing adjustment and scale; fairly long-focus lens—about 8 inches for 5 x 4 and 10 inches for half-plate. The long-focus lens not only gives better perspective, but enables an inaccessible rock on which waves are breaking to be rendered a fair size on the plate. A half-

View
made from
15 to 20
feet above
sea-level



The same
view at
sea-level



Two views showing influence of high and low standpoint. F. J. Mortimer

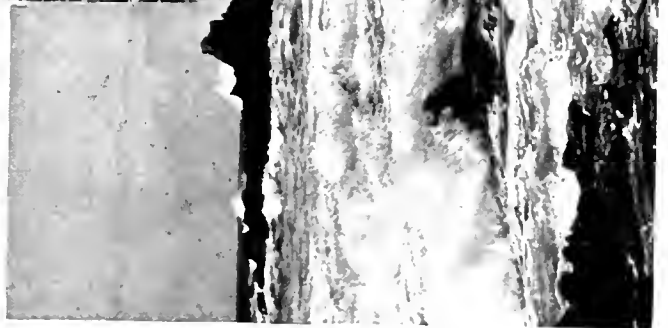
plate camera will be found quite large enough for the work, and larger sizes are not recommended. They will be found cumbersome when climbing over rocks, and decidedly an encumbrance if a hasty retreat has to be beaten before an incoming rush of water. A roller blind shutter is necessary *in front* of the lens, with adjustable speeds up to one-hundredth of a second, and there should be a focal-plane shutter also.

There are excellent cameras on the market that nearly fill these conditions, but none quite. At all events, it is quite clear that the plainest and most straightforward camera will prove the most serviceable. One's friends are unlikely to appraise one's value by the amount of brasswork on a camera, but rather by the practical results achieved. Beware of the highly ornate camera with a multiplicity of movements and much highly polished brasswork. After a few days' real earnest work among the breakers a change comes over the once beautiful example of the cabinet-maker and brass-finisher's industry. A green deposit resembling verdigris forms on the brass in an astoundingly short time, and the bellows yields a goodly crop of variegated mildew. One cannot stop at the time to wipe it, as the camera is promptly drenched again.

Protecting Apparatus If, through force of circumstances, the wave photographer elects to use the camera he has, and it is of the bellows description, a good coating of oil or vaseline, if applied to all brass and polished wood-work every morning before proceeding out, serves its purpose for a time, and plenty of dubbin (oily leather reviver) rubbed into the leather bellows also helps.

The best plan is to have the extended camera enclosed in a light strong box made for the purpose, and in such a manner that the focusing adjustment is easily get-at-able, and the back and front hinged to open so that the shutter can be set easily and dark slides inserted, and all shut up again ready for exposure. There would be an aperture in front, of course, and a finder on top, and the pneumatic release of the shutter can easily be brought through a small hole in the side. Most folding cameras can be adapted in this way.

Made with
a 15-inch
lens on
half plate



Two views of the same
rocks showing the difference
in size resulting from the
use of lenses of different
focal length

Made with
an 8-inch
lens on
half plate

View - Finder The most useful kind of view - finder will be of the direct vision type, either of the plano-concave variety, with centering lines and guide pin—the biggest obtainable—or one of the folding wire type now being fitted to the popular folding cameras.

Holding the Camera A tripod is of very little use in these rough-and-tumble bouts with wind and water, and not much scope is offered or possible, for focusing on the ground - glass, unless a spot is carefully selected for the rock formation and a visit paid on the following day, when the wind and tide are in the desired state. The worker, therefore, should accustom himself to holding the camera steadily in the hand at eye - level, which experience certainly points to as the best position for all - round work. A substantial strap handle fixed to the side (left side usually) of the camera facilitates this; or, if two hands are used to hold the camera and aim it, the ball of the pneumatic release can be held between the teeth and smartly bitten at the instant of exposure. If the incoming wave is carefully watched, the camera need only be raised for a little time only, a decisive glance made through the finder, and if at the right moment the wave is thought worthy of an exposure the shutter is let go. One must think and act swiftly, for in many cases not only must one snap at the foaming billow, but also retreat expeditiously to avoid a ducking.

Lens and Exposure As regards the lens, of course, as with any other form of photography, the finer the quality of the objective the better the average of work will be, and at all events the best that can be afforded should be used.

There is no doubt that the actinic value of the light present under normal circumstances when dealing with seascapes is enormous, and the most probable fault with the majority of the exposures made at first will be over-exposure.

Naturally the same conditions as regards the relative value of the light at morning, noon and evening, apply here as elsewhere; but as a rough guide it will be found that with a fairly rapid plate $f\ 16$ and $\frac{1}{100}$ sec., will

give a fully exposed plate at noon on a bright day in early spring. An exposure meter will be a great help in determining the value of the light, as occasional thunder



Two views showing effects secured when working
with and against the light
F. J. Mortimer

clouds, etc., alter its actinic quality in an astonishing manner. When the sun shines the exposure can be lessened considerably or a smaller stop used, as there is

possibly nothing of more material whiteness than the foam of breakers in direct sunlight. This, therefore, points to the fact that a high-class anastigmat is not absolutely necessary for this work, as the ordinary rapid rectilinear stopped down to $f/16$ will give all the critical definition necessary, but nevertheless occasions may arise when larger apertures are wanted, and the high-class lens then scores for its defining powers.

I have heard it said that a fifteenth of a second is ample for most wave studies. This may be the case when only one wave forms the composition. Doubtless by watching for the right moment, a good picture might be secured with this exposure, showing only a minimum of movement. But my experience points to the fact that there are usually other factors to be considered in addition to the main mass of water, such as minor wave crests and possibly a seething whirl of surf in the foreground, and generally it will be found that the eighth of a second gives a far truer rendering of the subject and more idea of action withal. The focal-plane shutter working at high tension is, however, a mistake, as with it the water appears frozen and lifeless, and might appear stamped out of tin.

Diaphragm Shutters The diaphragmatic type of shutter may be dismissed at once, as not of much use for wave photography, for several reasons. The first, and most important perhaps, is the fact that the shutter is constructed entirely of metal, and offers so much of its working parts to the action of the air. A week's exposure to sea spray and salt air makes such a shutter practically useless. The working parts become clogged with rust, and the marked speeds become utterly unreliable, even if the shutter does not refuse to work at all. Another reason is that a shutter working between the lenses leaves the front of the lens exposed, which, of course, is to be avoided at all costs.

Curtain Shutters Of the foreground and roller blinds or curtain, time and instantaneous shutters used before the lens, the balance is in favor of the time and instantaneous pattern. For subjects, however, with dark rocks in the foreground or on one side and clearly defined, the foreground shutter



View
made
with
lens
protected
and
dry



The
same
view
made
with
lens
damped
by
spray



View
showing
the
frozen
effect
resulting
from
focal-plane
shutter at
high speed

is likely to score ; but in dealing with a subject so uncertain in its action as waves breaking amongst rocks, one can never tell from one moment to another, even with the most careful observation, whether the foreground will be a dark mass of rocks and weeds or a tearing, bustling mass of seething foam. In this case the foreground is absolutely, no matter what the lighting may be, the brightest high light in the picture, and would be badly over-exposed with a foreground shutter.

**The
Focal-Plane
Shutter**

The focal-plane shutter seems to give a distinctively characteristic rendering of moving subjects, and its high efficiency makes it a desirable adjunct to the camera *for occasional use*. It undoubtedly gives a maximum exposure to a dark foreground consistent with the actual exposure, and it scores on dark days when the before-lens shutter would not admit a sufficiency of light when working at a high speed to expose the plate properly. Care must always be taken, however, not to overdo the speed tension, for the reason mentioned before.

The high efficiency of this shutter also permits of a smaller stop being used than with any other form of shutter. The ideal camera, therefore, as I mentioned at the outset, would have both a before-lens roller blind shutter and a focal-plane shutter, the former proving exceedingly useful as a safety cap while using the latter, by setting the front shutter to "time" and, when the instant of exposure approaches, pressing the pneumatic release, which will uncover the lens, release the focal-plane shutter, and allow the front shutter to close again. After a little practice this can be done in about a second for the complete operation.

**Plates
and Films**

Whether orthochromatic plates offer any special advantages over the ordinary kind for wave photography pure and simple, is a moot point. When a pale screen, however, is used—as it undoubtedly can be used, even with exposures of one-eightieth of a second—the orthochromatic plate naturally offers advantages. But it will be found that the intense white foam is quite sufficiently rendered against the usual slaty or blue sky on an

ordinary (unorthochromatized) plate to need no further correction, and in the majority of cases where a screen is used it will be found to over-correct the sky values.



Upper—taken on an ordinary plate, no screen

Lower—taken on an ortho plate, with screen

The plates should certainly *always* be backed, and, as shown previously, a very high speed plate is unnecessary, except in special circumstances.

Color-sensitive plates and screens will be found useful at times when all else has failed to render the relative tone values of rocks and waves satisfactorily, but they are not always necessary, as in most instances a fairly quick ordinary plate (backed, of course) and foreground shutter will prove sufficient. The light is so actinic, and the contrast between the intense white foam and blue sky so marked, that unless considerable care is taken, color-sensitive plates and screens are likely to give over-correction and render the sky unnaturally dark. They undoubtedly give more desirable results when dark green rocks, which under ordinary conditions would photograph black, need to be correctly rendered. In this case, the increased contrast between foam and sky can be neglected in order to secure a harmonious leveling-up of the more vivid contrast with the rocks.

Films and color-sensitive plates are more liable to attack than ordinary plates, but every care must be taken of both amid such climatic conditions as exist in the neighborhood of an exposed rough seacoast, if uniformly good results are to be achieved. Plates and films should be carefully packed after exposure (film to film—nothing between) in oiled paper, well wrapped in a final cover; put in their original boxes, and kept in an air-tight tin case if possible. If the unexposed plates are also kept in such a box, or wrapped up with one's clothes in the traveling trunk, no harm should come to them, as all makes of plates are now usually sold very well packed.

A Film Caution When spool films are used, a calcium tube can be recommended as a complete safeguard against the damp salt air if they are likely to be kept for any time before development, otherwise mold spots, or even a salt crystallization, will appear frequently on the films (and plates also) even after fixation, washing and drying in such an atmosphere. Plates should not be kept in the plateholders, or film in the camera, longer than is absolutely necessary. This general caution applies, of course, to all kinds of flat films, such as Film Pack, roll films, and plates of every sort.

**Changing
Plates**

The subject of changing and packing plates whilst on tour is one worthy of very serious attention. Many a fine holiday's work has been utterly wasted through inattention to this detail. The idea that seems to permeate the brains of many photographers on their holidays is that, having made the exposures, the plate or film can take care of itself until such time, several weeks or, maybe, months later, as the negatives are developed after the return home. A plentiful crop of fogged, pinholey, scratched, and light-struck negatives are brought into being, and abuse is heaped upon the unfortunate plate-maker, the camera, the lens and, in fact, everything but the real cause—lack of proper care after exposure.

A small ruby lamp of the folding variety should always be taken when on a photographic trip, or, better still, one of the travelers' candle lamps with ruby glass, as this can also be used as an ordinary reading lamp (a plentiful supply of candles should be secured). If no friendly dark-room is obtainable in the district, plates should be changed at night in the bedroom by the light of the ruby lamp. No special precautions are really necessary to cover the window of the room on an ordinary dark night beyond pulling down the blind, but if it is a "bright" night, or moonlight, or a street lamp is shining into the window, a blanket should be pinned over all. The push-pins with glass heads are very handy things to take with one, and a couple of blankets carefully fastened over a window with the blind down will usually be found ample protection even in the middle of a bright day. One's common-sense, however, will tell whether the light is unsafe or not. Plates can thus be changed in comfort at any time, and if packed in the manner before mentioned no negatives should be spoiled.

A notebook of exposures should
Memoranda always be carried for future reference

when the plates are being developed, and in addition to the usual data of subject, light, plate, stop exposure, etc., notes should always be made whether dark rocks or other special features are in evidence. Each plate as taken out of the dark slide or car-

rier should be numbered with a number corresponding to its consecutive number in the notebook, and no better or handier method of numbering plates can be suggested than that of writing the number on the film itself (small, of course, and in one corner) with a black-lead pencil. This can be done with a little practice in the dark—as, indeed, the plate-changing can if necessary—and also has the great advantage of remaining on the negative after developing and drying, and thus reference can be made at any time after to the notebooks to ascertain the conditions of light, etc., under which the negative was secured.

Checking Exposures A trial negative should be developed from time to time to see if all is well—whether the shutter is working at the right speed, and if one's approximation of the light value has been correct; whether the plate-changing arrangements are safe, or to see if any of the apparatus has developed a leak under the prevailing conditions of damp, etc. An occasional negative thus produced and errors discovered in time often save many plates and much annoyance afterward when the opportunities to reproduce the negative are long past.

Development This brings us to a consideration of the development of negatives of wave and sea photographs.

There is much to learn concerning the right treatment of marine or surf exposures which experience alone can teach. Our negatives are practically all high-speed snapshots of subjects teeming with light and atmosphere; conditions most likely to produce flat over-exposed negatives, and sometimes containing the most violent contrasts in the shape of dark non-actinic rocks and the whitest of foam in juxtaposition. Such difficulties should be treated with all due respect and caution, and the mechanical individual who does not strive to mix a little brains with his developer will be apt to find himself in difficulties and disappointments.

Adurol Preferred Personally, I must confess to having a decided predilection in favor of adurol as an all-round developer. It is not exploited much by its makers, but I regard that as



IN THE TEETH OF THE REEF
F. J. Mortimer

rather in its favor; and in the form of a concentrated one-solution developer I find it admirable for plates, films and bromide papers. It affords at once a developer perfectly under control, capable of giving exquisite gradation and the acme of density when required. Temperature seems to have little effect on it, and it yields a distinctly black deposit, the actinic quality of which can be judged at once. It does not stain and can be used repeatedly. The following formula I invariably use, and for the production of most wave negatives it is excellent: Adurol-Hauff, $\frac{1}{2}$ ounce; hot water, 10 fluid ounces; sodium sulphite (crystals), 4 ounces; potassium carbonate, 3 ounces. This is the concentrated one-solution developer. For normal use, take one part of the above solution and add six parts of water. Always, however, dilute the developer considerably when developing wave photographs, no matter what developer is used; one has then far more time to examine and consider, and no harm can ever be done with very dilute developer for any subject.

Slow development in very weak developer is best suited to the class of negative most desirable, and I find that stand development, using a dilute adurol developer, gives as good a result as any.

An alternative developer that can be employed with success for this type of work is metol-hydrokinone made up as in the following formula: *A.* Hydrokinone, 160 grains; sulphite of soda (crystals), 2 ounces; water, 20 ounces. *B.* Metol, 130 grains; sulphite of soda, 3 ounces; water, 20 ounces. *C.* Carbonate of soda, 3 ounces; water, 20 ounces.

The normal developer is composed of equal parts of *A*, *B* and *C*, adding a few drops of 10 per cent bromide of potassium solution if required.

This developer is more under control if diluted with an equal bulk of water, and it is so constituted that almost any degree of faulty exposure can be compensated for. For instance, for over-exposure the developer should be made up of two parts of *A*, one of *C* and none of *B*, with the addition of 10 per cent potass-

bromide solution. For under-exposure use: two parts of *B* and one of *C* and no bromide. This will give a developer as energetic as any known formula and bring out all detail that can be secured.

Each worker, however, usually has his own methods of development which he understands and uses for general work: but whether pyro, metol, hydrokinone, ortol, adurol or any other developer is used, always aim at getting a negative full of detail and thin. This gives the rocks a chance, and is also the right kind of negative from which to make a good enlargement.

My Method of Developing Developing in normal developer until the details just appear all over the plate, and then placing the negative in a dish of plain water, allowing the action of the developer to continue until all detail is out, especially in the rocks, is useful at times, afterwards obtaining what density is required by a further application of the normal developer.

When developing such contrasting subjects as foam and rocks together, local development can be resorted to with much effect, to make the most of the exposure and to drag forth obstinate detail from dark corners.

The old dodge of breathing through a small paper tube on to the under-exposed part is always efficacious, particularly in cold weather, and I have recently tried, with considerable success, the application of hot steam conveyed through a thin rubber pipe from the neck of a small glass flask half full of water and kept hot over a spirit-lamp. The end of the rubber tube pours forth a steady stream of warmth, and can be directed with the greatest ease to any part of the negative. Do not, however, apply it too long to one place or the film may soften, particularly if it is borne in mind that the very parts requiring the application of heat as an assistance to the development, are the very parts least able to withstand it—i. e., have the least metallic silver present.

A Different Way Another method of local development, and one I employ frequently, is to pour off the developer and, after swilling the plate with water, drain, and gently blot the film with

lintless blotting paper until surface-dry. Then apply the developer, or even a more concentrated form of it, with a soft camel's-hair brush, to the parts requiring help. At the least sign, however, of the developer spreading too far, flood the plate with water again, and repeat the process until all detail is obtained. Do not, however, apply a plain alkali in solution alone, as is frequently recommended, as this will inevitably cause chemical fog if persisted in, without bringing out much extra detail. The concentrated form of the developer in use is much more likely to bring out all there is to bring.

The same method of blotting off and local application can be employed, of course, with restrainers, i. e., potassium bromide or sodium citrate, when any part of the negative requires keeping back, and will be found far more under control than attempting the same procedure on the wet negative.

Before Printing The application of matt varnish to the back of the negatives where the rocks may show almost as clear glass will also level up an under-exposure in a very appreciable manner.

Carbon Prints As regards the best printing medium to show wave pictures to advantage, I do not think that any one will dispute the claims of carbon. This exquisite process, with its infinite variety of colors—especially blues and greens—lends itself in every way to the production of pictures of waves. The depths of the shadows are enhanced by the pigment, and the acknowledged longer scale of gradations obtainable by this method than by any other gives emphasis to all the delicate details of the high lights. No process I know of is capable of reproducing with so much fidelity the beautiful range of tones in surf and foam as carbon, and the prints have a richness obtainable by no other process.

The single transfer process offers no objection, as the reversal of the picture is of small moment with such subjects, and the production of bigger prints, necessitating enlarged negatives, offers so much scope for the improvement of faulty exposures in the production thereof that no excuse can be entertained.



THE TEMPEST
F. J. Mortimer

Bromide Prints Next to carbon I should place bromide paper in the scale of utility, especially when the advantages of direct enlargement are considered, and most wave pictures give a much finer idea of their grandeur and magnitude when enlarged considerably bigger than the original half or whole-plate.

Sky and Clouds The sky and clouds in pictures of breaking waves also deserve careful consideration. Usually it will be found that the dull stormy sky present at the time of taking the picture needs no further attention, and its very bareness serves to add additional emphasis to the seascape itself. Generally, too, if clouds are present they will be secured with the one exposure, even on an ordinary plate. In fact, the sky portion of the negative will be usually much lower in tone than much of the moving water. My ideas on iso plates and screens for this kind of work I have previously given, but if the sky should be quite bare and clouds are thought necessary, the usual precautions when printing-in clouds should be observed. A good plan that I frequently adopt with these subjects when the sky portion of the negative is much thinner than the water, is to make a suitable cloud negative from one of my stock of cloud *positives* (cloud positives are very useful things to have, as any size negative can be made from them to suit any subject, besides giving one a better idea of what the clouds are like than the negative), and place it over the wave negative, glass side of cloud negative to film side of wave negative, clearing away all unnecessary parts of the clouds that overlap or obtrude with Farmer's cyanide reducer. A sheet of thin celluloid can be placed between the two negatives for the protection of the wave if necessary, all three being held together with a couple of clips. When only the required cloud form remains, it should be washed thoroughly, and, when dry, bound to the wave negative lantern-slide fashion — *film* side of cloud negative to *glass* side of wave. The combined negative can then be printed from the thickness of the wave negative, giving a delightful softness to the cloud not otherwise obtained. In fact, I contend that the

usual methods of printing-in clouds from a second negative are wrong.

The very best known picture-makers even, who advocate atmospheric diffusion to a great extent in their pictures, generally print in perfectly sharp cloud forms—which in nature would be infinitely further off than the most distant plane of the picture, usually very much out of focus. This is obviously absurd, and is due to the fact that cloud negatives, as a rule, are carefully focused. The clouds should be as much out of focus as the extreme distance of the picture, and more so, to get an effect really true to nature. Thus the plan I give for printing-in clouds with wave subjects at one printing should commend itself to workers in other branches of photographic art.

Telephotography I have received many inquiries with reference to the application of telephotography to the portrayal of breaking waves. My experience, however, points to the fact that telephotography finds more scope in theory than in hard practice when dealing with such a subject. With the exception of the high actinic value of the light, the conditions usually surrounding wave photography are distinctly unfavorable to the delicate susceptibilities of the telephoto attachment. The elements are unruly, and the operator may find it frequently a matter of difficulty to prevent himself from being literally blown away.

Consideration shows the futility of trying to use the extended camera with heavy tele-attachment in the midst of breakers that expend their violence on the rocks around, amid showers of salt sea spray, flying grit, weeds and spume. Even on calmer days, when the great oily rollers stream in from the vasty deep, a visible quivering of the air is observable, arising possibly from vapor or from the almost invisible spindrift blown hither and thither. At all events, although under exceptional conditions with the camera lashed firmly under the lea of a sheltering rock, a telephotograph may be taken successfully of waves and rocks at inaccessible points, the game is hardly worth the candle. It were better to leave the telephoto outfit at home; the exceed-

ingly rare occasions on which its use can be attempted hardly compensate for the distress of mind and body arising from its conveyance over the rugged rocks.

In addition to this, very little focusing or composing of the subject can be attempted in any case on the ground-glass, and one has to depend largely on the reliability of the view-finder and focusing scale. Using the camera on a tripod is also objectionable. First, although perhaps the least important difficulty, is the vast amount of adjustment the wilful three legs require on the uneven rocks, especially in the midst of driving wind and spray, and the general instability the entire structure presents when it is finally adjusted. Secondly, the fact that the shutter has to remain open during the entire period of focusing, etc., which not only means that the lens is immediately covered with salt spray and has to be constantly wiped, but the frequent wiping in the presence of so much salt and grit is not conducive to the long life of an expensive instrument. Thirdly, the scene is one of such constantly changing action that unless a particularly pleasing conformation of rocks, etc., present themselves for portrayal, the camera held in the hand is much more likely to secure the best result than when fixed pointed in one given direction.

Composition If, however, the photographer insists
Difficulties on composing his picture on the ground-glass and uses a tripod, the lens can be protected by a piece of thin glass (a lantern-slide cover-glass answers admirably) held temporarily in position on the front of the shutter by elastic bands and the picture composed through it. Constant wiping does not hurt this, but do not attempt to *focus* through the glass; either rely on the focusing scale, or at the utmost steal a peep at the last moment when the occasion offers to remove the cover-glass, before setting the shutter.

The portrayal of vast breaking waves is probably the one phase of photography where a quick eye and a quicker brain to think are essentials to success. The conditions that govern ordinary composition by the camera are nearly absent. A picture is formed for an instant—an awe-inspiring magnificent composition, teeming with strength and motion. Light, shade,



THE SPIRIT OF THE STORM

F. J. Mortimer

action, everything is there—for an instant. The next instant—nothing.

There is not the least doubt that an eye trained to snap-shot work in the streets, when fleeting impressions are secured and favorable grouping made the most of on the spur of the moment, is of immense value in gauging exactly when to release the shutter at a mighty advancing mass of breaking water. There is no time to consider the principles of composition. The mind must be made up at once; the idea of the complete picture secured instantaneously with the release of the shutter, as the exact conditions may never occur again.

The Point of View Generally speaking, the camera should never be pointed straight out to sea, unless a picture of waves dashing over rocks at some distance from the shore is aimed at. The usual effect when the camera is pointed straight at the incoming breakers is unsatisfactory. There seems a lack of stability, and frequently the repetition of horizontal or parallel lines of rollers is displeasing, whilst those breaking in the immediate foreground look unreal and have a "lace-curtain" effect. Endeavor, therefore, if possible, to take the breakers at an angle. Have the shore—be it beach or rocks—run more or less diagonally across the base of plate and take the advancing and smiting billows more in "profile" than "full face." The idea of action is thus better conveyed, and more solidity is secured for the base of the picture. The contour of the coast-line and of the recurring waves should be observed carefully before exposing a plate, and the most likely setting for a picture sought out. The opportunity for the exposure should be watched for with everything ready, and the instant it occurs make no mistake.

The Best Season As regards the best time of year for big-wave photography, there is little to choose between the late autumn and early spring. Here, possibly, we find the answer to the query why so little deliberate wave photography is attempted. Photographing waves is undisguisedly a damp pursuit, and as most individuals dread a wet skin as an adjunct to their picture-making, it is unlikely that

Top view taken
"straight on,"
Lower view taken
at an angle



Two views showing
the effects secured when
the camera directly faces
the surf, and at an angle

F. J. Mortimer

a branch of camera work which is to be followed at its best during the bleak autumn days, to the music of a howling gale, exposed to chilling winds, stinging spin-drift, and possibly rain squalls, will be preferred to the milder delights of photography at home, or, at least, under more cheerful conditions.

"Feather-bed" photographers had better let wave photography alone, for, although on many a bright spring day fine breakers may be cast on the rocks around the coast by ground seas, the circumstances I have here mentioned are, unfortunately, the usual accompaniment of the "real thing."

The ardent photographer, however, will probably apply his own methods, etc., and bring to bear upon the work in hand the experience he has gained in other divisions of hand-camera work. I feel sure that if he takes up marine photography he will not begrudge the extra trouble to be taken and the hardships he will probably have to undergo in securing the counterfeit presentment of one of the most striking and most beautiful of all natural phenomena.

F. J. MORTIMER.

Postscript

The following notes, sent us by Mr. James H. McCorkle, are the outcome of a year's experience in surf photography along the coast of Maine, near Portland. As the two reproductions from his prints show, Mr. McCorkle has achieved a notable degree of success in this peculiarly difficult field. Taking pictures and notes together, we see that success depends chiefly on the man and his familiarity with local conditions, rather than upon the following of special methods, or the use of this or that kind of apparatus. Thus Mr. McCorkle uses a Century folding camera on a tripod, a Century focal plane shutter, and fast isochromatic plates, finding these sufficient for the requirements of his locality. Mr. Mortimer, on the other hand, has sought to portray the wilder aspects of the sea at close range. Hence his preference for an enclosed camera, always used in the hand. We have little doubt but that, under similar conditions, the two workers would find themselves more closely in agreement than is shown in these pages.

—EDITOR.

Whosoever would make a series of photographs of old ocean in its various moods must, above all things, prepare for many and vexatious disappointments and should lay in a big stock of perseverance.

In the sea we have a different subject and different conditions with each succeeding change of tide and wind. Ledges that are covered at high tide make most desirable pictures at low tide with the wind in a certain direction. Let the wind shift but a point or two and your picture disappears. A great deal, therefore, depends upon one's knowledge of the coast along which one works. We must know it under many different conditions of light and weather. And, after all, successful surf photography is largely luck, of the sort which comes to those who deserve it by their devotion.

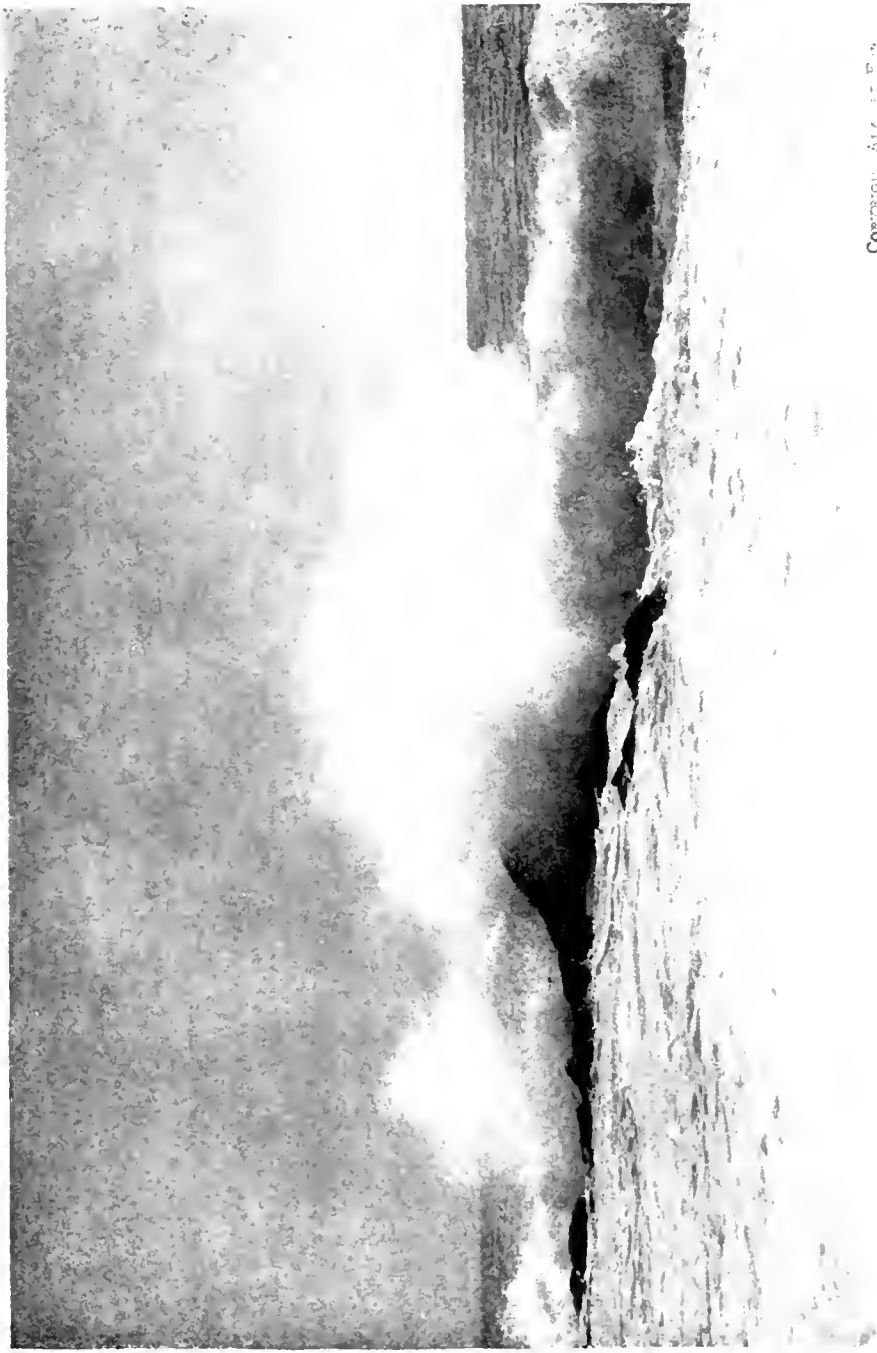
“What to wear” is as important in surf photography as at a wedding. It is useless to go to the work unless one can be wholly indifferent to one's clothes. Beginning with the feet: in disagreeable or cold weather, use hip boots of rubber; at other times “sneakers” or rubber-soled bathing shoes may serve. Oilskins and a sou'wester are essential for difficult work at close range with a heavy sea running. Everything worn should be chosen to stand wetting, and the boots should give sure footing at all times. Woollen stockings will prevent any danger from cold wet feet.

This must be extra heavy in material and construction so that it will stand wind-stress and not slip at the joints. Tripod When working on a wet ledge, a slip of the joint in a tripod leg may result in the loss of one's apparatus. Sometimes the tripod will be in two-feet depth of surging water, hence the need of stability. After a trip the tripod should be washed clean of salt and sand, dried and oiled, or it will quickly become unfit for use.

Get as simple and as strong a camera as is possible. All the parts should be well constructed and of material which will not be ruined by frequent wetting. A view camera, without elaborate movements or fancy fittings, will serve the purpose better than an expensive leather-covered hand-camera.

Any modern lens by a reliable maker, Lenses which will work at $f/8$ or quicker, will meet most requirements. Sometimes an extra rapid lens of the most modern type is desirable. Personally I use the Cooke lens $f/6.5$, usually stopping it down to $f/16$; on especially favorable days, $f/22$; on dark or dull days, $f/8$.

All my work has been done with a Shutter Century focal-plane shutter and I have found it completely satisfactory. On a $6\frac{1}{2} \times 8\frac{1}{2}$ or 8×10 camera it is, of course, somewhat bulky, but the results it gives compensate for this. Other kinds of shutters rarely exceed $\frac{1}{1000}$ second exposure and at that speed require the lens to be used at its



Coastal Air - 1914

OFF THE COAST OF MAINE
James H. McCorkle



James H. McCorkle

full aperture. With a focal-plane shutter working at $\frac{1}{500}$ second up to $\frac{1}{500}$ second and the lens at $f/16$ or $f/22$, I get correspondingly soft and yet detailful negatives.

Wherever possible I would advise
Plates plates sensitized for color values, such as the Cramer, Seed, Hammer Orthos or Orthonon. Surf, as I see it, presents always a mass of the most delicate lights and shades and color values, and unless these are secured in the negative, the beauty of the spray is lacking. There is a difference of opinion as to the speed of plates for wave photography. Personally I prefer a very fast plate, a quick shutter, and a lens stopped down as far as it is safe to go. In this way I take advantage of the increased detail obtained by stopping down the lens. As I have found it, no plate is too fast for surf photography.

On bright and clear days, or when
Color Screen the illumination is favorable with a cloudy sky, a light color screen will offer advantages, giving additional detail in near-by rocks and the shadows of the water. With an Ideal Ray Filter I have secured full exposures at $f/8$ and $\frac{1}{300}$ second with the focal-plane shutter. This, however, was under the most favorable circumstances and cannot be taken as a guide in the use of the color screen.

This is an important detail of the
Focusing Cloth equipment. In landscape work one may be indifferent as to the kind of cloth used, but when working along the shore we will encounter rain and spray, often driven in sheets by the wind. A good mackintosh cloth, one yard by two yards, will be none too big, for it has to serve as watershed for the camera as well as for focusing. Get the best cloth obtainable and keep the camera covered at all times save at the instant of exposure.

Success depends on many uncontrollable factors: the condition of the tide, the size of the waves, the position of the sun or source of illumination, the amount of rain or spray met with, the possibility of getting within proper distance of what we want.

The amount of surf running has an important bear-

ing on the effectiveness of the photograph; Too high or too large a surf is as undesirable as too little surf.

The chief rule, to be observed to the limits of safety, is to get down in front of the incoming waves as low as is possible and point the camera at an angle. The lower the camera, the higher and more effective will be the dash of the spray. When a tremendous surf is running, it breaks so far in and dashes so far back that it is not safe to get down in the crevices to secure the picture. In many ways a surf not running too high is desirable, as one can then go further out on the rocky ledges and approach the subject to better advantage and usually from a lower point. When the lens is only three or four feet above the water-level and a burst of spray goes ten feet into the air, it seems to go far above the horizon line and gives effectiveness to the picture. The same spray burst, if taken from a point a few feet higher, would be dwarfed by the higher horizon line.

On the Atlantic or East coast, with few exceptions the sun rises toward the sea, so that the morning light is rarely available for photographing surf. Thus the time of day is a factor in some localities. In regard to tides, the one-third tide, either ebb or flood, is that generally advantageous. Then many seaweed-covered ledges are uncovered, with stretches of water between them and the main shore, while the waves break on the outer ledges and the photographer is shielded behind them.

Given all other conditions favorable, the surf itself is ever the problem.

A storm out at sea will sometimes roll up a fine surf while it is perfectly clear on shore, but more often it comes after a north or southeasterly gale of two or three days' duration. Two hours' blow from an "off shore" wind will flatten down the surf so that it is altogether uninteresting. Often, too, a good surf is accompanied by such heavy rain and heavier spray that exposures are impossible, and, if practicable, give only flat and gray pictures. Before the storm breaks there may be a favorable moment, but the big waves come after and not before the storm.

There are rare chances when the rain ceases and the

clouds grow thin. The photographer is fortunate who happens on such a chance, with tide and wind in his favor. The photographer who seeks to picture the sea must not be easily discouraged. If he perseveres, he will find light and wind and tide as he wants them sufficiently often to give him pictures worth all the weary waiting and disappointments.

In developing surf negatives, I adopt **Development** no special methods or formulæ other than those obviously indicated where extreme delicacy of lights and shadows are in question. After the image has plainly appeared, I take the negative out of the developing solution and soak it for five or ten minutes in clear water. This gives the developer in the film a chance to bring out the finer detail without overdeveloping the more fully exposed portions of the plate.

Finding that in many cases, while the surf was wholly satisfactory, the sky was flat and gray and the rocks without detail, I tried to remedy this by many ways, but after considerable observation along the shore I found that it was a condition natural in the subject and not a fault in my negatives. With an overcast sky and the snowy whiteness of the spray, the rocks in the foreground lose their detail and gain depth of color as masses. Thus rocks full of detail to the eye without the spray lost much of their detail when the burst of white foam came behind them.

It is possible to improve one's negatives by making first a contact *positive* on a rapid plate, and from this positive a second negative on a slow plate. In developing the second negative on the slow plate, get the detail, then immerse the plate in water alone. Now take the plate in one hand, holding it flat, and go over the sky portion with a finger wetted in the normal developing solution, being careful not to encroach on the surf portion. Rinse the plate in water and repeat the operation, touching only the sky and rocks. In this way it is possible to build up the less exposed parts of the scene and get a brighter negative than the original which meanwhile remains intact in case of failure with the duplicate.

**After-
treatment of
Negatives**

In the development of isochromatic plates care should be exercised to carry the development far enough to get crispness. Much of the beauty of surf pictures depends upon the effect of wetness and brilliancy.

In every case, look over your ground in fair weather and again during storm before attempting work with the camera. You will then know where to go for what you want, where the big waves break to the best effect, and how far you can venture out to sea. This will eliminate much of the danger, as well as the element of chance, from your picture-making.

After a day's work along the shore, scrupulously clean the camera, lens and other apparatus of all salt water, etc., putting each separate article in a warm dry place until thoroughly dried. By attention to this detail your apparatus may be kept in good condition, ready for service, for years.

JAMES H. McCORKLE.

Notes and Comment

The new general catalogue and price-list issued by Hirsch & Kaiser, 7 Kearny Street, San Francisco, bears witness to the enterprise and growth of this well-known firm of Pacific coast dealers. In its 112 pages, printed on heavy, enameled book-paper, may be found almost every known convenience on the photographic market, described in an interesting way and profusely illustrated. We are asked to mention that this year the distribution of the catalogue is limited to photographers on the Pacific coast, every one of whom should secure a copy for reference and information.



Those who are experimenting with the sulphide toning of bromide prints, along the lines recommended by Messrs. C. Winthrope Somerville and R. E. Blake Smith, should note the warning of Mr. J. B. B. Wellington, an English expert, who says that the fumes of sulphur given off from the sulphide of sodium bath used in this process are deleterious to plates, films and printing papers. For this reason he advises that the toning of bromide and gaslight papers with the sulphide bath should be done in some place other than the room where plates and papers are stored.



We regret to hear that a somewhat serious accident recently befell our good friends, Mr. and Mrs. H. Snowden Ward, of *The Photogram*, London, in the overturning of a trap in which they were driving on a photographic expedition. Mr. Ward escaped with slight injury, but Mrs. Ward was less fortunate and is confined to her room with a broken wrist and other injuries which will prevent her from taking up photographic work for some little time.

A handsome volume containing much practical information has been issued as a *Souvenir of the Conference of Photographic Dealers, held at the works of the Bausch & Lomb Optical Company, Rochester, N. Y.*, last February. The book is published for private circulation only, but much of its information on lenses and cognate subjects is so unusually practical and to the point that we hope it will eventually be given a wider publicity.



The advertisements and business booklets issued by C. P. Goerz, of New York, Chicago and San Francisco, show noteworthy improvement in interest and style since this firm secured the services of Mr. A. K. Boursault as manager of the advertising department. There is abundant scope for this sort of improvement in the publicity given to photographic lenses, and we trust that Mr. Boursault's work for the Goerz concern will awaken in the trade a better appreciation of neglected opportunities.



The seventh edition of *Hammer's Little Book* (Hammer Dry Plate Company, St. Louis, Mo.) is at hand, and appeals to us as a clean-cut, dignified and thoroughly practical booklet well calculated to satisfy those who seek information about Hammer plates and their advantages for different branches of photographic work. Copies can be had on request from the publishers, addressed as above.



Lloyd's Photographic Encyclopedia, 1905, reaches us just as these pages close for press. In form and make-up as interesting and attractive as ever, the book has been completely revised in every department, retaining, therefore, its established reputation as the most complete and satisfactory of photographic reference books issued by the trade. Special attention should be called to the new list of Thornton-Pickard exposure shutters, which includes all the new models in focal-plane and other styles. Copies of the *Encyclopedia* can be had on request from Andrew J. Lloyd & Co., Boston, Mass.

Laboratory Notes

Under this heading will be published from time to time notes dealing with special points or difficulties from the chemist's point of view.

ACID FIXING IN EMERGENCY

An acid fixing-bath has come to be considered a necessity for the successful working of gaslight papers on account of the extreme readiness with which these papers may be stained. Even with an acid bath, the prints must be quickly covered with the hypo solution and must be kept moving for the first few seconds. For fixing plates and films, while the acid bath is not a necessity, it is much superior to the ordinary hypo, especially in warm weather when stains are likely to occur, and when the hardening produced by an acid alum bath is an important advantage. For use at home most of the usual formulæ for acid fixing-baths are all that could be desired. But for the tourist, it is desirable to avoid weighing and to use dry, readily obtainable chemicals wherever possible, as liquids are not only bothersome but may do considerable damage if a bottle should become broken. For such use the following bath is excellent: Warm water, 1 pint; anhydrous sulphite soda, $\frac{1}{2}$ level teaspoonful; alum, 1 level teaspoonful; cream of tartar, 1 rounded teaspoonful. When dissolved add: Hypo (measured in graduate), 4 ounces. Stir and it will quickly dissolve.

This formula should produce a perfectly clear acid fixing-bath, suitable either for gaslight prints or for plates or films. By using warm water, the resulting solution, after dissolving the hypo, is of ordinary temperature and ready for immediate use. If water of ordinary temperature is used the hypo will cool it so much that the solution will be extremely cold, will fix

slowly, and be likely to cause blisters. By measuring the chemicals, instead of weighing, considerable time is saved, and the accuracy is sufficient for every purpose.

Some workers prefer to leave out the alum in a fixing-bath used for plates and films, as the hardening produced by the alum makes the gelatine of the negative hard and impermeable, and such negatives are much more difficult to intensify or reduce than negatives which have not been thus hardened.

ERNEST A. TURNER.

Books and Prints

Marton's New Treatise on Modern Methods of Carbon Printing. By A. M. Marton. 260 pages; illustrated. Cloth, \$2.50. Postage, 15 cents. Published by the author, Bloomington, Ill.

This second and revised edition of Marton's *Carbon Printing* is the fullest and most comprehensive handbook to the subject in the language. It bears evidence of having been written from actual experience and its instructions are altogether reliable. We regret that in the chapter on his new rapid process for sensitizing and drying carbon tissues in five minutes (to get which many carbon workers will doubtless purchase the book) the author gives a formula calling for his special "Chromic Sensitizer" instead of giving plain information about the sensitizer itself.



Aide-Memoire de Photographie pour 1905. Edited by C. Fabre. 336 pages; 4 x 6; paper covers. Fr. 1.75. Paris: Gauthier Villars et cie. This is the thirtieth year of issue of Fabre's handy little yearbook. It contains a careful résumé of the year's work in many departments of photographie and lists of photographic societies in Europe, with blank pages for notes, etc.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume VI

SEPTEMBER, 1905

Number 72

Photography for Profit

BY THE EDITOR

"How can I make money by photography?" is a question often asked by both amateur and professional workers. The amateur finds that his hobby is an expensive one and he would be glad to find some way by which he can make it self-supporting, or at least let it assist in paying its own bills. The professional in only too many cases has spare time on his hands which he would gladly turn to profitable account; but beyond conventional portraiture he has little idea of turning his time or knowledge into money. When we come to consider the various byways of profitable work, we are surprised to find how numerous they are, and how little worked. In commencing business as a professional portraitist, a man usually enters into competition with already-existing workers, and endeavors to obtain a share of a demand already catered for, rather than to create a new field for his work; the amateur—if he would succeed as a money-making amateur—opens new fields which have not been locally worked. A good example of a field in which amateurs have scored, and created a new line in photography, is to be found in the present large output of "nature" work. Among the pioneers in this work were, it is true, some professional workers whose love of nature and the open air was stronger than their regard for dollars, but they were men almost before their time; the amateurs came in on the wave of demand

and have reaped the reward. There is no one line of work which is suitable for all cases. The man in a large town and the man in the small village has each his own special limitations and opportunities. There is only one constant factor; a man may be an amateur but he must not be "amateurish." Unless a man can do good work he need not attempt to draw profit from photography.

Photography for profit may be divided
The Field into two sections,—first, the making and selling of photographs for various purposes, and second, the making for, or working for photographers themselves. In the first list may be included all portraiture, the photographing of at-home groups, etc., of buildings, animals, boats and other possessions, photography for the press, including daily newspapers, magazines and books, copying of pictures or legal documents, art studies, advertisement work, etc. In the second list come developing and printing for amateurs, the preparation of home-sensitized papers or fabrics, making enlarged negatives or positives, preparing developers or other specialties, writing for the photographic press or on photography for the lay press, giving instruction in photography, etc. Some of these lines bring thousands of dollars annually to photographers; others merely turn an occasional dollar into some local amateur's pocket. But every line described in this issue of *THE PHOTO-MINIATURE* is one in which money is at present being made by some worker or workers. It is for each reader to decide which line is most suitable for his own case.

Probably the amateur will be more
Apparatus interested in learning the possibilities of the apparatus he already possesses than in knowing what is the ideal outfit for any particular class of work. With certain reservations in favor of apparatus, it may be said that the man himself is the principal factor. A hand-stand camera not smaller than 4 x 5 and preferably of 5 x 7 size, fitted with an R R lens working at $f/8$, and of not less than seven inches focal length, is a very useful all-round tool. Of course if fitted with a lens working at $f/5.6$ its efficiency will be

increased; but I have a camera such as described—in fact a No. 5 Cartridge Kodak—which has traveled thousands of miles in America and Europe, and which has penetrated to the heart of Africa, and taken hundreds of salable pictures, and which still retains the lens with which it left the Rochester factory. In the succeeding paragraphs special apparatus will be described when referring to its particular uses.

Usually the photographer will work in **Coöperation** coöperation with some other worker. In some of the lines to be described a printer will be a needed partner. But where the business is in direct photography the pictures may be disposed of through some local store. In a small city views should be on show at least at the post-office and at the drug and news stores, the selling being done on a commission basis.

Picture Postcard views are increasingly popular, and on account of their local application are a valuable factor, and this not merely to the amateur. Not a few professional photographers who have specialized on “private” postal cards have found the line develop until it has become the best paying part of their business. No village is too small for postal cards—often indeed the best field is the tiny town without a professional photographer. Such a town will have a number of views of local interest—the depot, the church, main street, approaches, etc. Private postcards have large money possibilities in them. If properly canvassed, few people owning a house and lot will refuse to order a dozen cards. And this does not exhaust the possibilities. There are photographs of gardens, of stock, of the farm, etc.; indeed, the man who has had a good year can find sufficient scenes of interest on his own land to warrant him in ordering quite a little series of views. Postal cards should come very near the head of a list of profit possibilities, for, though small lines in themselves, they may be worked in every district; and, though leaving a small profit on each transaction, bring a good return for the time devoted to them. Once a desirable set of negatives has been secured, the prints may be made in half-tone by a local printer, or a photographic card can be utilized.

The camera by no means exhausts the possibilities of profitable photography. **After Work** The "doing of the rest" is a lucrative branch of work, as many photographers and dealers in supplies have discovered. Developing, printing, etc., for wealthier or less enthusiastic amateurs will pay many a worker's photographic expenses. Tasteful mounting and framing has proved a useful line to women workers in touch with a number of photographers. We will first consider the making of special styles of photographs which are useful to the professional as well as the amateur, and can be made profitable.

Prints on Fabrics Blue prints, photographs on cloth—silk, linen or other textile material—are not difficult to make, and are effective as specialties. The fabric should be washed, particularly if it be new. Allow it to almost dry and iron out with a moderately hot iron. It is usually wise to size the fabric, this tending to keep the picture more on the surface, and so adding to its brilliancy. Sizing is effected by soaking the material in a one per cent solution of hard gelatine. After being dried the fabric is ready for sensitizing. The blue print is the simplest method, and it gives satisfactory results. Of the many blue print formulæ we use the following: No. 1: Ammonium citrate of iron, 1 ounce; water 4 ounces. No. 2: Potassium ferricyanide, 1 ounce; water, 5 ounces. Select clean crystals without adherent powder; it is well to just rinse them in water immediately before dissolving. When the crystals are dissolved, mix and filter the solutions. Keep the solution in the dark, and mix fresh frequently as desired, for, though it will keep, it tends if old to yield dirty whites. To sensitize, stretch the fabric on glass and brush the solution over it, evenly and quickly, passing the brush first in one direction, then in the other. It should be hung in a warm dry place to dry quickly; if not dry at the end of three hours, facilitate matters by laying it between chemically pure blotting paper and passing a warm iron over it. Printing is as usual and fixing by washing in cold water. If the washing water is hard, give the first rinse in water slightly acidulated with hydrochloric acid.

**Silver Prints
on Silk**

We have said that the blue print is the simplest method, but almost equally simple is the silver print on silk, following the method of a professional photographer who does a considerable trade in these pictures. Wash out the silk and iron while damp. Salt by soaking for a few seconds in a weak solution of common salt, and dry before the fire. Dissolve 100 grains of nitrate of silver in three ounces of water. Place this in a clear glass bottle in direct sunlight for a day or so. The solution will become muddy, and the mud (organic matter in the water) will be precipitated. When the solution is clear it is ready for use. Pour a little in a flat dish and saturate the silk in it. Dry before the fire and again soak, this time with the other side nearest to the fire. This sensitizing and drying may be done by lamplight. Use a vigorous negative—weak, delicate negatives are unsuitable for fabric printing—and print deeply. Wash in several changes of water and fix in a weak 10 per cent bath of freshly mixed hypo. This method ignores both sizing and toning and yields good results on silk.

**Jarman's
Method**

Having dealt with rough-and-ready methods, it is only right to say that much fabric has been spoilt by workers using defective formulæ or difficult processes. We now give a more careful method of work, using formulæ recommended by A. J. Jarman. A first essential is absolute cleanliness, and a second, the use of distilled water in mixing solutions. Make a salting and sizing solution as follows: Soak 125 grains of hard gelatine in 25 ounces of water. Add common salt 100 grains; ammonium chloride, 25 grains; magnesium lactate, 125 grains. Warm the solution so that the gelatine completely dissolves; soak the fabric in it and suspend to dry. Mix sensitizing solutions as follows: No. 1: nitrate of silver, 120 grains; water, 4 ounces. No. 2: citric acid, 50 grains; white sugar, 50 grains; distilled water, 20 ounces. Soak the fabric in No. 1 for three minutes; drain until surface dry and draw it carefully through No. 2. Hang up to dry, when it is ready for printing. This sensitizing should be done in the dark-room or in yellow light. The fabric should be kept under pressure,

when it will keep good for about a week, but it is better if used fresh. The print is made in an ordinary frame. If the fabric is to be examined during printing, it should be attached by light touches of glue to a card. It is a good plan to sensitize a small extra strip of material which may be used as a test on the negative to be printed from. Having made the test, the picture can be printed by time. Prints should be masked with a clean edge or vignette, and a margin of fabric left all around in case the picture is to be sewn into a cushion. Wash the print in several changes of water and tone in saturated solution of borax, 3 ounces; water, 30 ounces; chloride of gold, 2 grains. As soon as toning is complete, wash in two changes of water and fix in a 10 per cent hypo bath. Fixing takes about ten minutes. After well washing in clean cold water suspend by clips to dry. If the fabric is very thin the preliminary salting solution may be 50 per cent stronger; otherwise the formula as given will answer every purpose for silks and other fabrics.

**Carbon
Prints on
Metal**

The making of carbon prints on metal—particularly in watch caps, etc., is a lucrative branch of work for a few workers to the trade. Warm brown or black tissue gives the most pleasing results. Make the sensitizing solution as follows: Bichromate of potash, 2 ounces; ammonia carbonate, 40 grains; filtered water, 50 ounces. When completely dissolved add a solution of salicylic acid 40 grains, glycerine 20 drops, hot water 4 ounces. Mix the solutions well, filter and let stand for several hours. Pour the solution into an enameled iron tray and immerse the tissue in it (if necessary wear rubber gloves while dabbling in bichromate). Break any air-bells on the surface of the tissue and after soaking three minutes lift it from the tray by two corners, drain it and lay face down on a sheet of perfectly clean glass. Press the moisture out by going over it with a squeegee, using a steady but not too heavy pressure. Then wipe the back of the tissue with a clean rag; and hang it up to dry in a clean, dry room. This sensitizing and drying should be done in a yellow light. This tissue will keep about two weeks. The sensitizing solution may be filtered and used four

or five times. As the single transfer method is used, a reversed negative is needed. Cut a safe edge from a piece of orange or black paper and attach to the film side of the negative. If the picture is to be inserted, the mask must be circular. After exposure develop as follows: thoroughly dissolve white sugar, 3 ounces in five ounces water. Filter into a porcelain tray. Soak the tissue in cold water until it is limp and then immerse both tissue and support in the sugar solution. Press into contact with the thumbs, then remove from the solution and cover with a piece of thin rubber cloth, pressing it well into the hollow. Squeegee with a flat pointed pencil or eraser, to squeeze out the moisture and press into perfect contact. This is not easy and requires patience and some little practice. When contact is obtained, let it rest for twenty minutes and then immerse in water not hotter than 120° F., allowing it to soak until the color begins to ooze. Strip the support away and keep the case moving in the hot water until the picture is fully developed. Rinse in cold water and immerse it in a 2 per cent solution of common white alum in water for three minutes. Wash in running water for five minutes and stand to dry. When dry, coat thinly with crystalline varnish — a solution of gun-cotton in amyl-acetate thinned with amyl-alcohol. To insure a picture being placed correctly on its support, mark on the back of the tissue the upright position. As watches are held in the hand to examine a picture in the case, the hinge of the latter is usually to the left hand.

Photography At-home

BY WILLIAM E. WARD

Conventional studio portraiture does not fill every need. People who are proud of a studio triumph often prefer some amateur snapshot, because it has caught some characteristic attitude, or suggestion of personality. By taking advantage of this preference, a

number of amateurs have gradually become professionals; several of them, including some ladies, obtain high prices by retaining their individualities rather than by emulating ordinary studio work. Some of these depend more on pictorial composition than on likeness—a practice which the occasional amateur should not follow, any more than he should attempt to imitate studio work. But the scope beyond is wide; and wider perhaps for the man in a country village or town than for the man in a large city.

Portraiture out-of-doors usually suffers from the lighting—a general flatness of face and an over-abundance of top light being the commonest evils. When taking a portrait in a garden or near a house, a wall giving a shade will prevent the flatness. Top light may be softened by suspending a muslin screen over the sitter's head; a piece of muslin stretched on a small frame or on a child's hoop will be sufficient. A blanket, suspended without creases or folds by a few bull-dog clips from a cord, makes a satisfying background; or a piece of canvas may be distempered any required color. Or gray paper felt such as is placed under carpets may be used. With this paper a "continuous" background may be made; that is, the felt strip may be long enough to continue under the feet of the sitter, and so by combining both fore and background get rid of the often objectionable line of junction.

A position beside or under a tree is often ideal as regards lighting, and a natural landscape or garden often provides the best of backgrounds. Indeed, the less the better of artificial shades or backgrounds. There is an opening for women workers in the photographing of children—especially young children, out-of-doors. And these should not be posed, but snapped when they are at play or standing at ease. A rapid shutter is not necessary for this work. The "slow instantaneous" speed of the shutter fitted to a moderate-priced camera, and working at perhaps one-fifteenth of a second, is sufficiently rapid when used by one who has had a little practice and can watch for a favorable moment.

Those taking up this specialty will find a special course of practical instruction in **THE PHOTO-MINIA-**

TURE No. 58, wherein a successful professional worker gives her individual methods, with some examples of outdoor portraiture.

At-home portraiture is attended with more difficulties than is outdoor work; these have been dealt with in Number 65 of THE PHOTO-MINIATURE series. The prime difficulties are the limited amount of light, rendering fairly long exposures necessary and the unsuitability of an amateur's camera, built for outdoor work, for use in the cramped quarters of an average room. Here a little selection of position will often make success possible. The sitter may be posed near a window, when the exposure may be reduced to a few seconds; and by taking a picture diagonally from corner to corner of a room the camera can usually be moved far enough from the sitter. A large mirror in a small room is sometimes useful. If both sitter and camera are placed some distance from it the reflection may be photographed and an added length of view obtained. Of course the camera and sitter should occupy such relative positions that the former is not shown in the negative.

At-home portraiture must not be confused with the photographing of interiors. A wide-angle lens may cover parts of three sides of a room, but a figure introduced into such a picture would be unsatisfactory. Sufficient to the picture is some detail of the room; a corner, or the fireplace, an easy chair, or the window.

Closely allied to home portraiture is the photographing of homes, interiors, exteriors and groups. The door-stoop is a favorite background for a group, and the house with a foreground of garden is a subject for which many people will pay. Similarly, a piazza offers many opportunities for group work.

Whatever place or building people are interested in is a suitable subject for photography. Every church is a center of life, and members will buy views not only of the exterior but also of the interior. And there are hundreds of churches, many of them with fine interior decoration, which are fallow ground for the camera. In a large city the photographer may best make money by

specializing on subjects with which he is in close touch. In the country there are local views and scenes which will prove selling pictures. Special occasions should not be neglected. There are festivals and fêtes in both churches and the country. Or a view may be profitless in summer, but of value as showing a record flood or snowstorm or other special conditions.

Copying Old Photographs In copying at home or in the studio, a cardinal rule should be "never attempt to restore the original." This, because such attempts may result in spoiling a valuable old photograph—valuable to the owners. Daguerreotypes and ambrotypes (so-called positives on glass) are often triumphs of photographic technique, the work of men who had sound old-fashioned notions about pose and conscientiously did their best. The daguerrotype is an ideal photograph for reproduction; the grainless delicacy of the original reproduces without any of that mealiness so common in replicas of paper prints. To avoid reflections from the polished surface the camera should be covered by a black cloth pierced with a hole just large enough for the lens to peep through; and a black tunnel reaching from the lens almost to the portrait will kill unnecessary stray light. Give a generous exposure and develop for the lights; if detail is forced in the shadows a flat print will result.

The ambrotype is a weak negative, the shadows clear glass; and this is turned into a positive by being backed with some black material, either varnish placed on the glass or film, or black velvet pressed against it. In the latter case the glass may be treated as a thin negative and a print made direct from it. If varnished and scratched, a piece of black velvet may be pressed against the glass and copying done in the camera. Paper prints are easier to copy than glass or metal prints. The principal troubles are yellowing and fading. An ordinary plate, with a pale blue screen, will best overcome the former difficulty. It is beyond the skill of the camera to reach any detail that has faded away. Portraits from old originals should be printed on single albumenized paper, thus aiding their old-fashioned appearance. Copies of paper prints have often the ad-

vantage of looking better and more vigorous than their originals, for they will be without the suggestion of yellow fadedness. Retouching should be avoided wherever possible. If the photographer is an artist, he may attempt to restore missing detail on the finished print; but usually any work beyond a minimum of spotting is to be deprecated.

**Copying
Daguerreo-
types**

Daguerreotypes present peculiar difficulties in copying and will usually need careful cleaning (not restoring) before copying. R. Benecke, an experienced worker in this specialty, gave the following method in *Mosaics* some years ago, and we have found it wholly reliable in practice:

"A daguerreotype when hermetically sealed will keep an indefinite length of time, but when exposed to the atmosphere it will soon tarnish and has to be cleaned before it can be copied. This oxide of silver can be easily removed and the picture will be as bright as ever. A greater difficulty we meet in copying is the scratches which are either caused by the polishing buff or by careless handling by incompetent persons in the attempt to remove dust, etc. Daguerreotypes will be defaced sometimes to such a degree thereby that it becomes an impossibility to copy them at all. When these markings are caused by the buff they will all run in one direction, and by placing them in the proper light on the copying-board they will show very little or not at all. In regard to the other scratches, we have to put the plate on the copying-board in such a position that they show least.

"To remove the blue oxide of silver, make a solution of cyanide of potassium, say one to ten of water, and pour it over the daguerreotype, which has to be previously freed from adhering paper, gum or paste. It is well for that purpose to put it into warm water for a while until gum and sticking-paper leave the plate freely. Do not let the plate get dry during this operation, and be careful never to touch the face. When the blue scum has disappeared, wash the daguerreotype under the tap and finally rinse both sides with distilled water. Set it up to dry on a piece of blotting-paper, or, what is better, take hold of the plate with a pair of pliers and

dry it over an alcohol lamp, commencing to heat it at the upper end and go gradually downward, until dry.

"There is a very unpleasant smell caused by the action of the cyanide on the plate, which, when inhaled, is apt to give a person a severe headache; it is, therefore, well to stand in the draft while operating.

"Now as to the lens, camera, stand, copying-board, etc.: Any good box and plate-holder will answer. Place the camera on a movable stand and fasten the lens to it by means of three screw-eyes. This is very essential, as it can thus be readily removed and replaced, and the effect of light on the daguerreotype be studied by removing the ground-glass and looking through the box at it. Move the stand about until you get a good view of it. If the buff markings show in one direction, they may become invisible by fastening the daguerreotype sideways to the copying-board. Now replace the lens, focus once more, and before exposing the plate, place a thin board, covered with black velvet and which has a hole cut out about the size of the front lens of your instrument right before it (the lens) and expose. This board will intercept all rays of light which otherwise might be reflected by the polished surface of the daguerreotype, and would mar the picture. All the rest is known. Do not use too small a diaphragm in your lens, as microscopic sharpness is more detrimental than beneficial to the final result. An inferior lens is therefore often the best for this purpose."

To copy large paintings, an anastigmat
Paintings or wide-angle lens giving great flatness of field should be used. An objection to the latter is its slowness, owing to the need for stopping down. The lighting of a picture needs care, particularly if it has a glaze or varnish surface. For lightly tinted pictures diffused daylight is best and most easily controlled. For many oil paintings, particularly if old and with warm mellowed colors, direct sunlight is almost a necessity. If copied by artificial light, two bright lamps, one at each side of the picture and fairly close to it, will give the most even lighting. In photographing color, orthochromatic plates and often color screens are necessary; the latter usually of a red or

yellow tinge, to keep the blues in check. With old stained engravings a blue screen will sometimes be required. With care, such screens are not difficult to make. Fix an undeveloped plate in a fresh clean solution of hypo and wash it well. The film is now clear transparent gelatine and may be stained by soaking in a solution of dye. Naphthol yellow, aurantia, fuschin red and chrysodin are a few well-known suitable colors. Unfortunately, no rules can be given either as to the density or color of screens, or the length of time needed for exposure. The exposure must be ample; black shadows are a frequent defect in copies, particularly of oil paintings. Develop with metol and develop fully or over, reducing if necessary with a brief immersion in a strong solution of Farmer's reducer. Ortho plates should be developed in darkness.

**Engravings,
Documents,
Etc.**

It should be a fixed rule never to tamper with originals. There is always a risk of spoiling valuable prints, and in the case of photographs required for legal purposes, any attempt to alter will prove disastrous to the cause it is intended to support. An upright easel should be used for support when a page is to be copied from a book. Usually with a little care the page can be held flat by a cord or by rubber bands, but it may be necessary to flatten it by pressing a sheet of glass against it. Use a slow thickly coated "Process" plate and develop with edinol-hydro. A useful method of copying very faded or stained documents is to develop the negative in an eiko-hydro developer until the detail is well out; fix in acid fixing-bath, wash well and when thoroughly washed bleach with the usual bichloride of mercury and blacken with sal ammonia solution; wash for fifteen minutes and when dry place in front of a dead black surface and photograph. The second negative may, if necessary, be intensified.

**Pseudo-
Ceramics**

Many photographers have at one time or another come to grief in attempting to produce ceramic photographs or pictures "burnt-in" on an enamel base. In theory this is not difficult, albeit a certain amount of special

apparatus is necessary. But in practice it proves so beset with slight troubles, all but unavoidable, as to lead to failure. But very serviceable imitations may be produced, as beautiful as the burnt-in pictures. A carbon film is transferred onto a porcelain or other vitreous support, and then, instead of being submitted to the great heat necessary for fusion, it is japanned — that is, the surface of the image is covered with a transparent varnish. The first stages of the work present no unusual difficulties, for they are merely carbon work. A tissue containing a maximum of pigment with a minimum of gelatine should be chosen. This is to a certain extent porous and by allowing the first coating of varnish to penetrate tends to bind all more closely to the support. Any color of tissue may be used and the picture may be tinted or colored if desired, before being japanned.

A good brand of amber or copal varnish should be used, of the kind known as "stoving varnish," or it may not stand the heat of japanning. Amber varnish is slightly the harder, but copal is preferable as being colorless. A very thin layer of this varnish is spread on the mounted tissue with a camel's-hair brush. This first coat should be mixed with an equal quantity of turpentine—it will then spread thinner. Brush marks will disappear during the stoving. One coat must be thoroughly dry and hard before a second is applied; if not, the unequal contraction may in the final stages cause innumerable little cracks. Let the plaque dry in a warm dust-proof place. When a sufficient thickness of glaze has been obtained by repeated coatings and dryings, the enamel is ready for stoving. This may be done in a gas-oven or the kitchen stove. A gentle heat, not less than 150° F. or more than 200° F., should be kept up for five or six hours. The enamel is then allowed to cool. When cold its surface must be polished, first with pumice powder and finished off with putty powder. The care and time necessary in working these enamels prevent their being other than a high-class specialty.

Photographs on Porcelain The easiest, and where only occasional work is done, the cheapest and most satisfactory way of making pictures on porcelain is to use Seed's opal plates. To make, plates

of pot opal (not flashed) should be used. They should be thoroughly cleaned in a hot strong solution of common soda, for any grease mark, particularly a finger mark, will show in the finished print. After washing in soda and rinsing in clean water, place for a few minutes in an acid bath: muriatic acid 2 ounces, water 20 ounces; rinse and stand in a rack to dry. When dry they are ready for coating. For sensitizing, soak 2 ounces of hard gelatine in 5 ounces of distilled water in a stoneware jar. When soaked, place in a saucepan of hot water and bring to a boil. Stir well with a clean glass rod and add (1) chloride of ammonium, 40 grains; water, 1 ounce; stirring all the time. Then (2) rochelle salts, 50 grains; water, 1 ounce. Rinse the graduates with a little water and add this to the jar. Remove the jar into a yellow light, and when the temperature has sunk to about 125° F. add gradually, stirring all the time, a solution of nitrate of silver 254 grains, powdered citric acid 48 grains, in five ounces of water. Stirring all the time, add ten drops of stronger ammonia and two ounces of pure alcohol. Set aside to cool for twelve hours, preferably in a refrigerator. The emulsion will set to a stiff jelly. Cut it into pieces with a clean bone or wooden knife and squeeze through coarse canvas into cold clean water. When the emulsion has settled pour off the water, draining it through a piece of canvas held over the bowl. Add more water, stir, and drain three times. Melt the washed emulsion in a clean stoneware jug by placing it in boiling water. When thoroughly heated, add nitrate of silver, 60 grains in an ounce of water, one dram of the solution to each pint of emulsion. Stir well and add 1 ounce of pure alcohol. Filter through a thick wad of absorbent cotton. The emulsion is now ready to use. A leveling slab of glass or marble is needed. This may be leveled on a table by little wedges of wood, in a cold room, and if in summer, chilled by being rubbed over with a block of ice. Take one of the cleaned porcelain plates by a corner and flow it evenly with emulsion, draining the surplus back into the graduate. As soon as the plate is evenly and thinly coated, place it on the leveled slab to set. When set, place the plates back to back, but not

touching, in racks to dry. When dry—probably in about twelve hours—pack away face to face until required. Print in a special “porcelain” frame or hinge the plate to the negative by a stout paper hinge so that it will fall back in register after being examined. When printed, wash well in cold water and tone with the borax toning bath recommended for fabrics. Fix in freshly mixed hypo and after a few minutes’ washing place in an alum bath; 2 ounces of powdered alum thoroughly dissolved in a pint of water. Wash well for an hour and dry. On no account use a combined toning-and-fixing bath.

Specialist Photography

BY C. W. CANFIELD

Every large manufacturing plant employs a photographer and many firms maintain a regular department for photography. There is scope for more work of this kind. Travelers are more and more limiting the size of their packs and using photographs of samples. This specialist work requires a man who can do first-class technical work. Many difficulties can be avoided, but others must be fairly met and overcome. The high, and often polished surface finish of a line of goods must be faithfully reproduced in the print. Often the work has to be done under difficulties of location, as with large pieces of machinery, etc.

Machinery in Situ Where the position of the machine allows of it, a fairly long-focus rectilinear lens should be used, or a noticeable distortion may result. A large machine, the cast parts of which are painted, usually receives a coat of gray before its final coat, and it should be photographed at this stage if a mere technical print is required, as probably will be the case. This obviates troublesome reflections from the varnishing of the final coating. Bright steel or varnished parts may be dulled by dabbing over with

putty or whitewash. A better wash is white lead and turpentine, mixed to the consistency of thin cream, grayed down with a little lamp-black, and then mixed with one-third its bulk of gold size, to give adhesion. The name of the maker, cast in relief or intaglio, may be rubbed over with chalk or filled in with whiting and water. Too much top light is to be avoided. The inner details of the machine must show, microscopically sharp, and heavy top shadows will kill these. White reflectors will help to supply interior light, and the floor may be scattered with white sand or sawdust, or whitewashed. Flashpowder, screened and out of view of the lens, may be used; or electric lights on flexible wires may be hung inside the machine, hidden behind some heavy part. Prints of machines are usually required against a pure white ground. A white background, out of focus, and where it will not cast a shadow, will tend to simplify blocking out. The height of the camera must be considered. Men usually look down on a small machine, but the best technical view of some machines will be obtained by placing the camera near the floor. Stop the lens well down and give a full exposure. Use a weak developer, and get just sufficient density to give a plucky print. In photographing a small machine, a two-foot rule in the foreground will give an idea of the size; with a large one, a man may be tending some part — not looking at the camera. The photographing of a completed machine is but a small part of the requirements. Photographs of details showing special adjustments or essential working parts are necessary in commercial work. And here the man who understands machinery has the advantage over a photographer from the outside.

Small	Small parts of a machine, e. g., the
Fittings,	cutting tools of a lathe, etc., must be
Samples, etc.	photographed separately. A board or
	shelf covered with black velvet or black

paint makes a good background for some subjects. A sheet of clean glass to which the tools may be lightly cemented will give a shadowless background. Behind the glass a white sheet of paper, preferably at an angle of 45° , will ensure the whiteness of the background. In photographing small bright parts of machinery, or

other commercial samples such as shoes or cut glass, we cannot always dab over the bright parts with putty, for the high finish is a necessary part of the picture. Lighting from a single direction is necessary. A muslin screen or tunnel placed between the camera and the object will soften the light. Highly polished, curved surfaces must often be toned down. A bright glass vessel may be dulled by bringing it cold into a warm room, or by filling it with ice water. It will steam over and must be photographed before the steam collects into trickling drops. Engraved glass may be rubbed with powdered talc and then lightly dusted, when the talc will adhere to the engraved parts only. Then fill the vessel with a very dilute solution of permanganate of potash; when a clear photograph showing the pattern may readily be obtained. Polished silver may be painted over, using a camel's-hair brush, with light carbonate of magnesia rubbed to a thin cream with milk. This gives a fine matt surface, with just a suggestion of glaze in the brightest parts, and may be cleaned off with a damp sponge.

**After Work
in the
Factory**

Technical records of patterns, castings, etc., are often required in a foundry or factory for the firm's own use. And the diagrams produced in the drawing-room require duplicating by photography, usually by the blue-print method or one of its modifications. A spacious workroom is, if not absolutely necessary, at least desirable. The often overlooked item of blocking out on a negative is one of the hardest parts of this work, and requires a steady hand. The film must be entirely free from grease (finger-marks). Grind Indian ink to a dense black and go over the outlines with a fine sable brush, well charged with color. Use a ruler along the straight lines. Blocking out, particularly when an intricate outline is being followed, must be done on a rigid retouching desk with a strong light reflected through the negative and all other light screened off. Night, with an electric bulb, or good reflected light shining through the negative, is the best time to work. The commercial opaques, such as Gihon's or Alvord's, are prepared for such work.

A field of work specially adapted to **Millinery, etc.** women workers is the photographing of articles of apparel. A glance through any magazine, particularly those devoted to the needs or interests of women, will show the large part played by photography in this class of work. The scope is not confined to magazine requirements. Business houses need photographic samples and records, and it is a line of work in which mere man is a poor second, provided the right grade of woman elects to fill the first place.

To make a list of the businesses which photography may prove helpful would be to list the businesses of the world. Each worker may be guided in his choice by two factors: first, the business in which he is employed, and second, the businesses carried on in his district. There are dozens of photographers in New York alone who make a specialty of fashion photography for fashion journals, advertisements, etc. It is not an easy field, but the skilful worker will find it profitable.

Souvenir Booklets In many towns there are opportunities for souvenir booklets. These should be worked by, or in conjunction with the local newspaper. The cost, including printing, paper and block-making is considerable, and the sources of revenue are advertisements and the sale of the book. A collateral advantage, if the work is undertaken by the local professional, is the personal advertisement. The photographer is responsible for the illustrations, and the newspaper man prepares the text—and obtains the advertisements. A strong personal element should be introduced into such a book; that is, people as well as places should be included. Prominent local men should be pictured, the school should include a group of the scholars, etc. Many souvenir books and booklets which have been financially successful have passed through our hands; and some which have been failures. The cash risk can be closely reckoned before proceeding with the work, and the income approximated. The vital question of sales is one which is difficult to forecast—often they are below expectations. And this largely depends on the business ability with which the book is handled. Leading trading interests may often

be induced to support the book, in return for more or less prominence given to their business. As a general guide, it is not wise to proceed with a book until advertisements to cover the bare cost are guaranteed. Tentative work in this direction may be undertaken at very slight cost; a few dummies of the book, with a sample illustration and page of text, will be sufficient to test the probable demand.

Nature Photography

BY E. A. LINCOLN

To be successful with nature work—the photographing of flowers, animals, etc., a man must be a true enthusiast. He must be an ardent botanist—or rather, flower lover; or he must understand the points of dogs or other animals. The catalogues of seedsmen call for thousands of photographs annually. Excepting only perhaps wild animals or fishes, flowers are the most difficult of nature subjects to successfully portray. Wild animal photography, when undertaken as it should be with animals not in confinement, is and must remain a special domain of the enthusiastic and patient camera sportsman. Domestic animals, however, offer scope to a large number of workers, for the work, while not easy, is not beyond the abilities of a fairly experienced photographer.

Dogs, and occasionally cats, often find their way to the studio, accompanied by their mistresses. Most photographers have taken satisfactory pictures of cats, but many do not find it easy to undertake such a commission and guarantee a good result. Fortunately the owner is often better satisfied than is the conscientious photographer. A lady is wont to hold her pet on her knee, or in her arms. The pet being quite at home in its position will before long remain sufficiently quiet to allow an exposure. With bright light, a rapid lens and a noiseless shutter, a pet

dog may be snapped in a fraction of a second as it gravely begs or balances sugar on its nose. Men do not so often bring dogs to the studio to pose with their masters, and they usually stand or sit with the dog standing beside them. This throws the animal nearer the edge of the plate and means a very careful focusing, and a longer exposure with small aperture.

For dogs photographed without their masters a tall table or bench should be used, the top thickly coated with warm glue and then sprinkled with sand (or if the work is done out-of-doors, which is always preferable, a bank may be used). A wing in front of the table should be similarly sanded; a plain screen may be hung behind. A well-trained dog will, despite the strangeness of the studio, often stand to attention under the word of his master; but if it is used to a chain it may be held. Instead of a chain use a slight piece of string, or of dull flexible copper wire inconspicuous against the background. The holding may be done by a third person, standing behind and leaning over the background. The camera should be focused, the slide drawn, and all ready for the exposure the moment the dog is in position. Let the owner stand facing the dog, just out of lens range. The moment the animal is still and sufficiently alert, press the bulb. Many plates are wasted by indecision in making exposures.

Animals Photographs of all animals, except perhaps cats, are best taken out-of-doors.
Out-of-doors And posed pictures are but a part of the work. Horses in the fields or in harness, dogs at play, or if sporting dogs, at work—make good pictures. The best camera for such pictures is the reflex type fitted with a rapid lens and a focal plane shutter. But good work can be done with simpler tools. A commercial shutter working at one-fifteenth of a second, or even slower, while it will not picture a horse or a greyhound at full speed, will take sharp pictures full of motion, or of natural arrested motion. And most owners will prefer motion which they can recognize, to the often grotesque portraits taken in the thousandth of a second. It is a case of stalking with the camera. Remain with the animals until a favorable moment, and then press the

bulb. If sporting dogs are to be taken, they should go out for a field trial with their owner and the photographer. Given a ready eye and hand, and decision, and the photographer will find that as soon as the dogs have got used to his presence he will have opportunities for snap pictures which will please.

There is a steady sale for "art pictures," and several firms have catered to this demand, more particularly along genre lines. A somewhat neglected line is in pictures of a more or less local character. Pictures of "evening pastures" or "the market wagon" lose nothing by being "genuine photographs" taken in the local parks or streets. In a large town such pictures are sold through the print shops by being displayed among the often cheaply executed bromides. The prints should be platinotypes or good bromides. Such firms will usually take one or two prints of a subject and order additional ones singly as they sell. There seems a very wide margin between the price paid to the photographer and that received from the public, but the selling is usually the most difficult and most expensive part of the work, and the photographer must treat such transactions as purely business, being content to receive a fair payment for his work. Thoroughly good pictures of pretty play scenes; pictures of young animals — kittens, puppies, rabbits, etc., always find a steady sale. They should be unmounted or just attached by the corners to pieces of fairly stiff "cover papers" of appropriate color and proportions for the individual print. A woman amateur within the writer's acquaintance has added \$500 a year to her income from the sale of two attractive subjects handled in this way. The negatives were the result of an afternoon's work with the camera at home.

Photography and the Press

BY CHARLES W. H. BLOOD

Writing for Magazines

Many of our photographic magazines pay for contributed articles. Among them THE PHOTO-MINIATURE is always ready to avail itself of practical information. Although photographers outnumber magazines by thousands to one, it is a curious fact that editors are by no means snowed under with suitable "copy." Accounts of rambles or holidays, accompanied by "pretty" pictures are not wanted by them, and are seldom paid for. Short practical articles are in demand, accompanied where necessary by diagrams. An article telling how to take an amateur portrait in the cramped quarters of a modern city flat, or a practical working account of the making of some commonly used piece of apparatus will prove useful to many amateurs and therefore acceptable to an editor. Long articles are not wanted. They should be brief and to the point, giving all that is necessary to clearly explain the subject under notice, but without padding. In sending an article to an editor, mention of the payment expected should be made; or the editor may be first written to, a brief outline of the subject with approximate number of words and diagrams being given. An editor will not do more than say if a subject seems likely — he will never definitely accept "copy" until he has read it. The payment for a short article of 1,000 words, with one or more simple diagrams, may range from \$3 to \$5.

General Papers

Many newspapers run photographic columns. Often these are compilations, the work of one of the staff, or even edited by some enthusiast in exchange for the pleasure of getting into print. But some editors have discovered that a live local column may be a feature instead of a mere filler, and will pay a sum, usually very small but regular, week by week, for such a column. Where there is a paper without such a feature, or with a weakly edited photographic

column, the editor should be approached with some definite offer. No absolute price can be indicated, but the column is worth space rates. If a good column can be syndicated to a dozen Saturday papers in as many different towns, this specialty may be made to yield a handsome return. The field is practically untouched as far as American papers are concerned. For general magazines, decorative heads and tailpieces, contents pages and the like are always in demand.

**News
Pictures**

Hundreds of men are engaged more or less fully in press photography. The pictures used in a year by a single illustrated daily will amount to well over 1,000. Many of these are taken by staff workers, and the remuneration is usually but moderate. But more pictures are bought from outsiders. The editor cares little where a picture comes from; he is only concerned as to whether he needs it. And pictures, particularly if personally submitted, receive full and prompt consideration. Next to being able to do the work well and quickly, an appreciation of what will prove acceptable is the most necessary faculty. With some workers the ability to see and to seize upon the right thing amounts almost to a sixth sense. A little observation of what the papers use will help in this direction, although it should never be overlooked that editors are in want of some new thing. News value and general interest must be considered. A great coal strike in Pennsylvania or a wholesale overflowing of the Mississippi may be of interest throughout the country—in which case daily and weekly papers throughout the country will need pictures. But except for great events, local happenings are of but local interest. A press photographer must take the initiative. When an event is chronicled in the press it is usually too late to think of photographs. And where an event can be foreseen there will be a keen competition of cameras. A large inter-university football match, being a journalistic certainty, will attract a number of cameras, and, as the editors will require pictures in their next morning's issue, prints must be delivered to them the evening of the match. Such a subject therefore would be among the worst for a beginner to select. There are always

scenes of minor local interest which the photographer may pick up, often because he happens to be on the spot at the moment. And there are pictures of every-day occurrences which need only the eye to see the possibility in them. Pictures submitted by post should be accompanied by stamps and a request for the prompt return of unaccepted pictures. Price is a difficult problem until a man learns the ropes by experience. An editor who usually pays \$2 for a print will, where possible, buy one for \$1 and object if asked for more. Some newspapers are very cavalier in their treatment of occasional correspondents, remitting only a small fee or ignoring it altogether.

The Sunday Press While daily papers confine themselves to news, the Sunday papers offer opportunities to those who cannot compete in the rush of other work. Almost any subject which is of general interest is suitable for a Sunday paper, and the text describing the pictures should accompany them. These papers are not so large a market as would appear at first glance, for much of the Sunday matter is syndicated, appearing in a number of papers simultaneously, and so costing each editor much less than a photographer would care to supply the "copy" for.

Magazines Unlike the photographic magazines, the general magazines are snowed under with offered stories and pictures, but they are always ready to discover a good subject. Articles on photography are seldom wanted, but good photographs dealing with subjects of general interest will appeal to editors. Whether the pictures are offered alone or in conjunction with a story, a preliminary letter outlining the story and enclosing one or two of the suggested pictures is advisable. Some editors assemble photographs, buying one here and there, and when they have got a good series turn them over to a staff man for the text; this not so much for economy as because they find it difficult to unearth men who can supply just what is required for their particular columns. To obtain a footing with magazines requires not only the ability to photograph and write well, but also more than a little steady persistence. Specialization is usually advisable. Among well-known photographers and

writers, one specializes on the working of large industries, another on historic American places, a third on wild animals or flowers, and so on. There are hundreds of trade journals in the country, and many of them are illustrated. The prices paid by them are usually small, but they afford a field to the photographer who is employed in their particular trade.

Photographic Souvenirs

BY A. J. JARMAN

Among the many side-lines in photography which the amateur or professional can take up with profit, the making of photographic souvenirs deserves more attention. In the subjoined article plain instructions are given for the production of views, portraits, etc., on various metallic surfaces, bright or matt, and celluloid, these being the supports chiefly used in the manufacture of souvenir specialties.

Metal Supports Generally, when the photographer desires to produce carbon prints upon a metallic support, especially upon a bright and highly polished surface, he employs a preliminary coating of normal collodion, this coating being relied upon as a substratum or go-between with the metal plate and the carbon print. This is especially so with a plate of copper that has been coated with silver and highly polished. For the production of carbon portraits upon bright copper or highly polished silver surfaces, the use of collodion is not necessary. Carbon prints upon metal surfaces are invariably produced by single transfer, so that the developing is made direct upon the metal. If the plate should be made of brass, nickel-plated copper, or a bronze of almost any description, then it is advisable to use a preliminary coating of collodion. This is necessary because the chromic acid which forms the base of the bichromate of potash (used to sensitize the tissue) attacks the zinc contained in brass,

or the nickel coating on copper, or any nickel alloy, combining with the nickel or zinc and liberating copper in a free state, giving spots and patches of copper upon the surface. Collodion, being an inert body, acts as a neutral layer upon the surface of the alloy.

The preparation of the carbon tissue does not differ in any way from the usual practice. A very good sensitizing solution for the carbon tissue to be used may be prepared as follows : Bichromate of potash (c. p.), 2 ounces; distilled water, 50 ounces; glycerine, 15 drops; salicylic acid (dissolved in hot water), 15 grains; carbonate of ammonia, 40 grains. Use cold.

When the above are completely dissolved, filter the solution through absorbent cotton and sensitize the tissue by immersing it for three minutes. Squeegee the tissue down upon a clean sheet of glass, then suspend it to dry in a ventilated and darkened room. Having the tissue ready, it may be kept for use in a printing-frame larger in size than the tissue, by placing in the frame a piece of thick sheet-glass covered with black paper. Put in the tissue, replace the back of the frame, and keep the tissue under pressure.

If it is desired to produce a grained surface upon, say, a plate of copper or aluminum, proceed in the following manner: Clean the copper-plate well by dipping it into and rubbing it with a small rag mop dipped in a solution of lye. This solution is made by dissolving a small quantity of potash lye, about four ounces dissolved in one quart of warm water; allow it to cool off before use. The copper-plate must be planished and polished previously. Having cleaned the plate with the potash lye, wash it well and dry. When dry, brush the back of the plate over with shellac varnish or asphaltum varnish. Allow to dry in a warm place. The plate should be handled by the edges only, the fingers not being allowed to touch the surface. The surface of the plate must now be rubbed well with a stick of charcoal, such as is used by photo-engravers. Dip the plate and charcoal into water; lay the plate upon a smooth board, inclined over a sink so that in rubbing the surface backward and forward, the surface grinding drops into the sink. The graining is produced by immersing the well-

cleaned copper-plate into a mixture of nitric acid 1 ounce, water 20 ounces.

If the graining is to be coarser, the water must be reduced to fifteen ounces.

In the course of a short time it will be seen that the surface of the copper has been attacked by the acid. Rock the tray a little, and in the course of a minute or two remove the plate, rinse it in running water, then scour the surface with a fine brass wire scratch-brush. This can be done by hand, or, if possible, use the rotary scratch-brush in a scratch-brush lathe of a silver plater. The object of the scratch-brushing is to rub down any slight bur formed by the etching of the acid. The plate may now be washed by dipping into hot water. It will dry by its own heat.

If aluminum be employed, hydrochloric acid (muriatic acid) must be used instead of nitric, because nitric acid will not attack aluminum except at a high temperature. The proportion of hydrochloric acid may be the same, with the addition of half an ounce of common salt. This lessens the intense action of the acid. The scratch-brushing must be resorted to as before, rinsing the plate, dipping into hot water, and drying.

Assuming now that a carbon print has been produced upon the tissue in the usual way, all that is necessary will be to take the copper, silvered, or aluminum plate, and dip it in the lye. Rub lightly with a soft cotton mop, rinse in clean water, and as quickly as possible soak the exposed tissue. Dip the tissue and metal plate into a syrup composed of white granulated sugar 1 pound, water 1 pint. This solution must be used only in a cold condition.

Place the soaked tissue and plate together; cover with a piece of India-rubber cloth, glazed side uppermost; place upon a level surface. Now apply a squeegee, lightly at first, then gradually increase the pressure at every stroke, not rapidly, but with a slow, heavy pressure. If several plates are used, some bright, some grained, the treatment is the same. Allow the plates to stand for fifteen or twenty minutes before developing. At the end of that period, place them in cold water, allow to soak for a minute or two, then transfer them to

a larger tray containing warm water. Rock the tray so as to get rid of the air-bubbles on the surface. Take the first tray, half fill it with water of a somewhat higher temperature, take one of the metal plates out of the warm water, immerse it, then carefully lift the tissue from one corner. All that will be necessary now will be to throw the warm water over the surface of the plate with the right hand, while holding the plate in a sloping position with the left hand. In a very short time the print will be fully developed. Wash it by dipping into clean, cold water; then immerse it in an alum bath compound of common alum 2 ounces, water 100 ounces.

The plate must remain in this bath for not more than five minutes, because the film should not be hardened too much.

Proceed in the same way with the other plates, and after the alum bath wash them by laying them in clean water from tray to tray, giving five minutes' time to soak, so as to completely remove the alum. They then may be placed in a clean rack to dry.

Carbon prints produced upon bright silvered plates have very much the same effect as daguerreotypes with this exception,—the portrait may be seen at any angle, hence they have often been called daguerreo-carbons. Prints produced upon aluminum have an exquisite velvety effect, being at the same time absolutely permanent. Color effects are available here.

Celluloid as a Support The demand for carbon prints upon celluloid has increased considerably during the past two or three years.

Although many have tried this beautiful process, few have succeeded so far as to produce with certainty a dozen prints without blistering, and many have given up this branch of carbon printing for this reason. It is proposed in this article to give a reliable method of working, so that the prints will be uniform and free from blisters.

In the first place, the celluloid should be sufficiently stout to prevent buckling, with a very fine matted surface on one side. The sensitizing of the carbon tissue, too, should be done with a solution of suitable strength, giving ready solubility. The drying of the

tissue should be carried on in a perfectly darkened room, and the sensitizing under a yellow light. The cutting up of the dried tissue must be done under a deep-colored orange light. These precautions are necessary to obtain pure whites in the high lights and a freedom from color in the safe edging. It is here assumed that the reader has some knowledge of the carbon process, so that the directions given may aid those who have failed in the production of carbon prints upon celluloid.

The sensitizing solution is composed as follows: Bichromate of potash, 4 ounces; carbonate of ammonia, 80 grains; glycerine, 30 drops; salicylic acid (dissolved in hot water), 30 grains; filtered water (or distilled water), 100 ounces. The salicylic acid may first be dissolved in 4 ounces of water, adding 96 ounces to make up the 100. As soon as the above ingredients are added and completely dissolved, filter the solution into a clean bottle through absorbent cotton and allow to cool. All is now ready to sensitize the carbon tissue.

Pour this solution into a tray about 20 x 24. Immerse a sufficient quantity of tissue in the sensitizer, and carefully unroll it beneath the liquid. Just as soon as it lies flat, turn it over face downward and allow it to remain just three minutes. Then remove it, lay face downward upon a clean slab of plate glass, and use the squeegee upon the back until all the superfluous solution has been removed. Wipe the back of the tissue carefully and lightly with a piece of clean rag. Lift it from the glass slab by the top corners, and suspend it by wooden clips in a darkened room to dry. Just as soon as the tissue is thoroughly dry it may be cut up for printing. The sensitizing solution remaining should be poured into a clean bottle, corked up, and kept in the dark-room for future use.

Carbon tissue sensitized as above will keep well for two weeks if stored under pressure. Assuming that the tissue has been exposed beneath a negative, and is ready for development, the following substratum must be at hand, having been previously prepared. It is composed as follows: Gelatine (Heinrich's hard), 2 ounces; water, 12 ounces; sugar, 2 drams.

Allow the gelatine to soak for an hour. Meantime prepare in a separate vessel a solution of chrome alum, 15 grains, and water (hot), 1 ounce.

The gelatine, water, and sugar should be put in an earthen vessel, or prepared in a small oatmeal kettle (popularly known as a double boiler), so that the water boils around the pot or inner vessel and causes the liquefying of the gelatine. As soon as the gelatine is well melted and very hot, the hot chrome alum solution may be added drop by drop, stirring the gelatine solution vigorously at the same time. Keep up the stirring for a short time after the last of the chrome alum solution has been added. Then filter a small quantity of this into a cup or small pot, and as soon as it has cooled down slightly it will be ready for use.

Have at hand a mixture of acetic acid, one ounce; water, six ounces. Take the pieces of celluloid, cut to size somewhat larger than the tissue to be transferred, and rub the matt surface well with a piece of canton flannel, dipped into the acetic acid mixture, until the surface is quite clean. Rinse under the faucet, and lay in a tray of clean water for use. For single transfer, take a piece of celluloid in the left hand by one of the top corners, and pour on some gelatine substratum while warm, having the exposed tissue soaked in clean water. Lay it upon the gelatinized celluloid, which must be in position on the squeegee board. Directly upon the top of the tissue place a piece of India-rubber cloth, smooth side uppermost. Then apply the squeegee gently at first, increasing the pressure until all the excess of substratum has been squeezed out. Lift the cloth carefully, wipe off all the remaining substratum with a wet sponge, and put the print aside until the remaining pieces of exposed tissue have been treated in a similar manner. In the course of a quarter of an hour development may be proceeded with.

This is best commenced by laying the prints in cold water to allow them to soak for about one minute. Then place them in warm water, and allow to soak until the tissue begins to loosen. Now lift the tissue by one corner, throw it aside in the waste-basket, and proceed with the development by throwing warm water

over the surface of the print with the right hand, holding the print by one corner with the left hand.

In the course of a short time the print will be seen to be fully developed. It must now be carefully rinsed in a stream of gently running water, and placed in a tray containing a solution of common alum (not chrome alum), three ounces of alum to one hundred of water. Allow the print to remain in this for five minutes only. Then, after soaking in another tray of clean water for five minutes, the print may be washed in a gentle stream of water and hung up to dry.

It will be observed that there is no sign of blistering or lifting of the film, and, assuming that the exposure has been correct, there will be no difficulty in producing one dozen or one hundred celluloid prints in any color, every one in perfect condition.

The National Convention

The Quarter-Centennial Convention of the Photographers' Association of America met at Boston August 8 to 11 inclusive, under the leadership of G. G. Holloway, of Terre Haute, Ind. This convention, as many of our readers know, is the most important event in the professional photographer's year. For some years past the Association has been steadily increasing in its membership and influence. We are reliably informed that almost fifteen hundred members registered at Boston, and to this number must be added fully three hundred ladies accompanying members and an army of manufacturers' representatives, salesmen, etc., bringing the total attendance up to close upon twenty-five hundred.

The convention was held in three of the largest halls of the Mechanics Building, one hall being devoted exclusively to the manufacturers' interests, another to the art exhibit and a third to the business sessions of the convention. The rooms were well designed for their purpose, and the comfort of everybody attending the convention was carefully looked after throughout.

The art exhibit comprised almost one thousand frames, most of the prints exhibited being larger than $6\frac{1}{2} \times 8\frac{1}{2}$. To give any detailed review of these would, of course, overrun the space at our disposal here. Suffice it to say that almost every professional worker of prominence was represented by his choicest work. The notable feature was the large number of exhibits from professionals in the smaller towns, many of whom were unknown by name or fame to those who attended the exhibition. Looked at from the purely personal point of view, the most interesting exhibit in the art section was a collection of six cabinet photographs shown by B. J. Falk, of New York. These were specimens of a new method of photography in colors from life, originating, we believe, in Germany, for which Mr. Falk has secured the American rights. Of the prints shown, four were made in Berlin and two by Mr. Falk at his New York studio. As examples of life portraiture in colors by purely photographic methods, these portraits surpassed anything we have yet seen in harmonious coloring, softness and general effect. The fleshing was particularly good. We understand that the new method is by no means easy to work, but there would seem to be little doubt of its ultimate success considering the excellence shown in these first examples.

Among the portrait exhibits which impressed us favorably may be mentioned the works of George H. Van Norman, of Springfield, Mass.; Will Armstrong, Charles Wesley Hearn, J. H. Garo, M. B. Parkinson, the Conley Studio, J. S. Compton, B. F. Yerex, F. R. Barrows and H. H. Pierce, all of Boston; Moses & Son, of New Orleans; S. L. Stein, Milwaukee; Dudley Hoyt, Rochester; Strauss, St. Louis; George Sperry, Toledo, Ohio; E. B. Core, New York; Herr Duerhkoop, of Hamburg; Louis Thors, San Francisco; J. W. Porter, Youngstown, Ohio; Towles Studio, Washington, D. C.; M. Janvier, Baltimore; E. Goldensky and R. W. Phillips, of Philadelphia; George E. Tingley, of Mystic, Conn.; and S. H. Lifshy, Brooklyn. Doubtless there were others whose work was of equal merit with those mentioned, but they escaped our somewhat hurried survey. The principal awards were as follows: *Grand*

Portrait Class: First Prize, Dudley Hoyt, Rochester, N. Y.; Second Prize, Morris B. Parkinson, Boston; Third Prize, J. W. Porter, Youngstown, Ohio. *General Portrait Class*: First Prize, J. C. Strauss, St. Louis; Second Prize, S. H. Lifshey, Brooklyn; Third Prize, Towles Studio, Washington, D. C. Fourteen Certificates of Merit with Honorable Mention were awarded, and sixty-four simple Certificates of Merit.

The professional programme arranged for the convention embraced a variety of papers, addresses and demonstrations bearing directly upon actual professional work from the pictorial and technical sides. A full report of these, together with the thousand and one items necessarily omitted in this brief note, may be found in the official report, which will doubtless be published *in extenso* by *Wilson's Photographic Magazine* and other professional journals. The many good things provided were enthusiastically appreciated by those who attended the business meetings and the hall was crowded at each session. Niagara Falls was chosen as the location for the convention of 1906.

The election of officers for the ensuing year resulted as follows: President, Charles Wesley Hearn; first vice-president, C. J. Van Deventer; second vice-president, Charles L. Lewis; treasurer, Frank R. Barrows; secretary, M. E. Wilson, of Savannah, Ga. The election for the presidency was a lively affair, but Mr. Hearn secured a majority over his two competitors, the sense of the meeting being that he had richly earned the honor and that the Association's interests were altogether safe in his hands.

Almost every manufacturer of note was represented in the Industrial Section. The dry-plate manufacturers had specially large displays, that of the G. Cramer Dry Plate Company, St. Louis, being especially notable. The Seed Dry Plate Company gave a continual demonstration of negative-making on Seed plates, and the Hammer Dry Plate Company had a strong representation on the convention floor. Burke & James, of Chicago and New York, showed a very full line of professional specialties. Space will not permit a detailed description, but our readers can see the full line for themselves by writing

for a copy of the new Burke & James catalogue, now ready, free on request. The C. P. Goerz Optical Works, Taylor, Taylor & Hobson, Ltd., Ross, Ltd., Bausch & Lomb Optical Company, Voigtlaender & Son, Eastman Kodak Company, Taprell, Loomis & Company, American Aristotype Company, J. DiNunzio, the Lumiere N. A. Company, George Murphy, Inc., Standard Dry Plate Company, Robey-French Company, the Prindle Process Company, Willis & Clements, Folmer & Schwing Manufacturing Company, Ralph J. Golsen, the Anthony & Scovill Company, Andrew J. Lloyd, Pinkham & Smith, G. Gennert, Rochester Optical Company, Century Camera Company, Doyle Matt Albumen Paper Company, and E. B. Meyrowitz, were personally represented, with exhibits of their specialties. Among the representative members of the trade we met were M. A. Seed, G. Cramer, L. F. Hammer, H. Haight (Robey-French Company), F. Harry Hall (of the Berlin Aniline Company), M. G. Gennert, Henry H. Collins, George Murphy, H. C. Reiner, B. Eichelman, G. M. Bolton, W. A. Taprell, E. L. Somerville, W. I. Scandlin, H. C. Fink (of Folmer & Schwing Manufacturing Company), A. W. Wunderlich and J. Pratt (of Ralph J. Golsen Lens House), B. Pelgrift (representing the Anthony & Scovill Company), J. W. Collinson (of Andrew J. Lloyd Company), L. J. R. Holst and A. K. Boursault (representing C. P. Goerz), J. Ronald Taylor, Jene Carbrey (the new manager of the Rochester Optical Company), J. M. Walmsley and G. E. Mosher (of the Century Camera Company), Claude Poulailon and J. E. Brulatour (of the Lumiere N. A. Company), J. DiNunzio, H. A. Collings (of the Standard Dry Plate Company), S. Trenner (of Ross, Ltd.), Henry Burke (Burke & James), Messrs. Noble and Ames (of the Eastman Kodak Company), and others.

Three noteworthy trade exhibits were (1) the stereoscopic apparatus employed to show the Lumiere three-color process at the Lumiere N. A. Co.'s booth, (2) the exhibition of prints by the Solgram Color Photo Co., and (3) the specimens of Colorprinte (Howe & Hall, Chicago).

We must not forget special mention of the Bureau of Information provided by the Robey-French Co., of Boston, and under the management of our good friends, Charles O. Lovell and Chester F. Stiles. This proved to be by all odds the best appreciated feature of the convention, including as it did a post-office, a tourist bureau, a resting-place, with free telephones and delicious claret punch. To the officers of the convention for their unvarying courtesy and good-will a word of cordial appreciation must be recorded. Of the many old friends in the profession whom we met and chatted with space forbids even the mention. The convention of 1905 passes into history as the most successful and the most satisfactory gathering of photographers in the history of American photography.

The Work of E. S. Curtis Among the Indians

Among the illustrations in this issue will be found four pictures of Indian life and types, bearing the name of Edward S. Curtis, of Seattle, Washington. They give the reader a glimpse of the really remarkable work, all too little appreciated, being done by Mr. Curtis among the Indians. This work is nothing more or less than an attempt to secure, single-handed and unaided, a photographic and pictorial record of the rapidly vanishing life, customs and ceremonials of the North American Indians.

Although still on the sunny side of forty, it is some years since Mr. Curtis established his reputation as a professional portraitist, and from his success in this specialty he derives not only a livelihood, but also the means wherewith to further his notable work as the photographic historian of the Indian. Apparently the work was first undertaken as a relaxation from the cares of business, the pictorial possibilities of Indian life

appealing strongly to the poet and artist in the man. By years of quiet study and frequent sojourn among the Indians, Mr. Curtis secured not only a broad knowledge of the Indian tribes but, what was of more importance, he secured access to their tribal and religious ceremonies and was allowed to photograph scenes, rites, customs and types never before recorded by the camera.

It is not difficult to appreciate the immense value and importance of this work to the ethnologist, the historian and the artist. In the nature of things, the "advance of civilization" is changing and obliterating the native life of the Indians and in a few years most of the old-time customs, ceremonial and tribal life will be lost for ever. To record this life is the tremendous task which Mr. Curtis has set for himself amid innumerable difficulties and discouragements. Thus far his collection embraces several hundreds of photographs, $6\frac{1}{2} \times 8\frac{1}{2}$ to 17×22 , illustrating almost every species of tribal type, the native life and customs of various tribes, their arts, beliefs and ceremonies. Viewed as a whole, the undertaking is the most remarkable artistic and historical work thus far attempted by photography in America. It has been enthusiastically endorsed by President Roosevelt, the Bureau of American Ethnology at Washington and other eminent authorities in this special field.

Some months ago, in the endeavor to secure wider publicity and recognition for his work, Mr. Curtis gave an exhibition of his Indian photographs at the Waldorf-Astoria, New York. The collection occupied two large galleries and gave a comprehensive survey of the results thus far accomplished. Incidentally, but in no uncertain way, the exhibition demonstrated Mr. Curtis' peculiar fitness for his undertaking. Thus, quite apart from the evident care for the scientific and ethnological points of his subjects, the pictures evidenced, in selection and treatment, a keen perception of the pictorial and artistic side of Indian life. The exhibition was visited by thousands of interested spectators, and the artists and art students of the city were enthusiastic over the strong pictorial value of the collection.

In conversation with Mr. Curtis, his predilection for

the pictorial side of Indian life is plainly marked. Without going to extremes, he aims, as his pictures show, to get pleasing composition, harmonious arrangements of light and shade and the story-telling or human interest in his work, combined with thoroughly good photography. Here, for instance, is his soliloquy as we stood before "An Indian Camp" which is reproduced herein from a large gum bichromate print in dull purple-browns and vivid yellowish reds.

"Alone with my campfire, I gaze about on the completely circling hill-top, crested with countless campfires, around which are gathered the people of a dying race. The gloom of the approaching night wraps itself about me. I feel that the life of these children of nature is like the dying day drawing to its end, only off in the West is the glorious light of the setting sun, telling us, perhaps, of light after darkness."

A Biographical Note: Abraham Bogardus

Photography has so completely entered into our every-day life and work that we are apt to overlook the fact that there are still living among us a few men who saw its first beginnings in 1839, and who have followed its rapid evolution as practical workers. Among these pioneers, Abraham Bogardus, of whom we present a recent portrait in this issue, is a notable figure. A few particulars of his career will, we are sure, interest many of our readers.

Born on a farm in Dutchess County, New York, 1822, Mr. Bogardus came to New York City in 1837 and "took lessons" in the new art of Daguerreotypy from G. W. Prosch in 1846. After two weeks' instruction he opened a Daguerrean Gallery at the corner of Greenwich and Barclay streets. During his first week in business he made only one portrait, the second week two, and in

the third week none. At that time sitting for one's portrait was quite an undertaking, the exposure time required being forty to sixty seconds. Very soon after, however, the time of exposure was shortened and the Daguerreotype became popular and Mr. Bogardus gave eighty or more sittings per week.

Within a few years the paper photograph displaced the Daguerreotype, and the Bogardus Gallery was moved to Broadway and Franklin streets to meet the new conditions. During the first popularity of the Carte-de-Visite Mr. Bogardus kept three skylights busy and delivered from 68 to 100 dozens of Cartes per day. Among his contemporaries at this time were Gurney, Brady, Lawrence, Insley, Hass, Harrison and Hill, the brothers Meade, Lewis, Bogert and other famous Daguerreotypists, now deceased.

In 1869 Mr. Bogardus was elected the first president of the National Photographic Association, and served, by continuous re-election, for six or seven years. During his long career in business he took an active part in the public life of the profession, and by his work and activities was widely helpful in shaping the present prosperity of the American photographer. He retired from active business life in 1887 and has since lived in quiet retirement in Brooklyn, an interested reader of current photographic literature and a frequent contributor to the *St. Louis and Canadian Photographer* and other journals.

With many of the older workers, Mr. Bogardus still believes the silver-plate Daguerreotype portrait the best thing yet achieved in photography, and it is a hobby with him to restore old and tarnished Daguerreotypes to their pristine freshness and beauty. Readers who possess any such Daguerreotypes and desire to have them restored (a difficult and uncertain task in unskilled hands) may safely entrust them to Mr. Bogardus, who may be addressed at 129 Herkimer street, Brooklyn, N. Y.

Our portrait of Mr. Bogardus was made expressly for THE PHOTO-MINIATURE by Mr. W. M. Hollinger, of New York, and we are pleased to be able, by his courtesy, to publish so clever a likeness of the veteran photographer.

Obituary

JOHN CARBUTT

Our readers will hear with regret of the death of John Carbutt, which took place at his home in Philadelphia, July 26, after a short illness.

The name of John Carbutt has been a household word among American photographers for more years than we care to remember. Coming to this country from England in 1853, Mr. Carbutt at once took up the practice of photography, and during the early sixties held the position of official photographer in the construction of the Canadian-Pacific Railroad. A few years later he entered upon professional photography in Chicago and, with his fellow workers there, suffered loss by the disastrous fire of 1870. After that event he came east and located near Philadelphia, organizing a company to introduce the Woodburytype process here. This project was afterward abandoned.

In 1879 Mr. Carbutt put out the first gelatine dry plates commercially available in this country. From that beginning arose the well-known and extensive business now generally connected with his name. Mr. Carbutt was an indefatigable experimenter along many photographic lines. He was the first to make orthochromatic plates in America, and three-color photography occupied a great deal of his personal attention right up to the time of his last illness. His color screens and other specialties for process engravers were widely appreciated by practical workers in reproduction.

He took an active part in the work of many prominent scientific societies, his contributions to the proceedings of the Philadelphia Photographic Society, the Franklin Institute and similar bodies being noteworthy for their practical suggestions and technical value.

We enjoyed the friendship of John Carbutt for more than fifteen years, and his passing leaves us with a deep sense of personal loss. Always more than willing to help in technical difficulties, he was guide, philosopher

and friend to thousands of photographers throughout the union. He was a man of strict integrity, kindly in his disposition, absorbed in his work and in his domestic relations. Our warmest sympathy goes out to those who knew him most intimately and upon whom his death falls as a sore affliction.

WALTER E. WOODBURY

A few weeks ago we were shocked by the receipt of a dispatch from Panama announcing the death of Mr. Walter E. Woodbury, which took place at Ancon, June 26. Mr. Woodbury had been on the Isthmus only six months, the cause of his untimely death being yellow fever. During his sojourn on the Isthmus Mr. Woodbury was the editor of the English section of the *Panama Star and Herald* and *Inter-Ocean Critic*, the news of his death being sent by his associate, Mr. H. J. Calm.

Walter E. Woodbury was the son of the late Walter B. Woodbury, of London, a famous photographic investigator in years past, whose name is associated with many inventions and processes now widely used. Inheriting his father's tastes, young Woodbury took up photography at an early age, but devoted himself chiefly to the journalistic side. He was the author of several well-known photographic text-books: *The Encyclopædic Dictionary of Photography*, *Aristotypes and How to Make Them*, and *Photographic Amusements*. For some years he had editorial charge of the *Photographic Times* and *American Annual of Photography*. Later he was associated with the Nepera Chemical Co., editing at this time a journal entitled *Photographic Life*, which had but a brief existence. Latterly he met with repeated failure and discouragement, and disappeared from sight until the sad end related above revealed his whereabouts.

D. H. ANDERSON

We regret to record the death of Mr. D. H. Anderson, which took place some weeks ago, at New York. Mr. Anderson was one of the oldest professional photographers in the United States, having entered

photography as a professional in the early fifties. He came into prominence shortly after the Civil War by his clever combination groups representing historical scenes, including actual portraits from life of those who participated in the scenes portrayed. By the successful exploiting of this specialty, which called for unusual skill and resourcefulness, Mr. Anderson achieved a modest fortune and contentedly followed high grade portraiture at various locations in New York City up to within a few weeks of his death. As a man, he was respected by all who knew him, his interesting and genial personality winning for him a wide circle of friends.

Notes and Comment

We have received from the Lumiere North American Company, Ltd., samples of five brands of dry plates introduced by this firm. These are the *Sigma*, *Non-halation*, *Orthochromatic C*, *Green Label* and *Lantern* plates. For rapid hand-camera work, especially with focal plane exposures, the *Sigma* plate has proved itself to be as fast as, if not a shade faster than, any other plate on the market, giving a very desirable range of gradation and an image of close texture. The *Green Label* plates are less rapid than the *Sigma*, but gave us thoroughly good negatives where the subjects did not call for extremely short exposures. We can recommend this plate particularly for portraiture. The Lumiere *Orthochromatic C* is apparently a panchromatic plate with a wonderful range of color-sensitiveness, this being pronounced in the yellow and green portions of the spectrum. For outdoor work with sunlit foliage or dark masses of green, or for difficult commercial work where color offers difficulties, this should prove a very useful plate. The *Non-halation* plate is, of course, indicated wherever strong contrasts are met with in the subject and for difficult interior work. In the latter, especially, we found the Lumiere *Non-halation* all that the most critical negative-maker could desire in speed, non-hala-

tion qualities and gradation capacity. Readers desiring to give Lumiere plates a trial should take advantage of the offer of the company to send a sample box on request. Communications should be addressed to the General Sales Agent, Mr. J. E. Brulatour, 11 West 27th street, New York.



The Solgram Color Photo Company, 9 Joseph's Alley, Downingtown, Pa., sends to our table four examples of the Solgram color process, together with a profusion of extremely interesting literature concerning this process. The four color prints portray genre subjects including vases, lamps, books, flowers, fruit, and although made, we are told, by a person unskilled in photographic manipulation, give a remarkably faithful transcript of the colors of the originals. We are also in receipt of a supply of Solgram paper and chemicals, and hope to report in an early issue of our own experiments with what looks like a practical solution of the three-color problem, so far as the amateur and professional photographer are concerned. The cost of working the process is nominal, and an explanatory booklet can be obtained free on request.



THE LEGAL STATUS OF PHOTOGRAPHY.—Paris, July 15.—Photography has been judicially pronounced to be a fine art by a decision of the courts, which is important to the large tribe of lovers of the camera. A portrait of some musical celebrity had been reproduced in a newspaper from a negative taken by M. Nadar, a well-known Paris photographer, and the editor refused payment. His counsel in court argued, rather disingenuously, that the French copyright law of 1793 protects writers', artists', and composers' works, but not photographers'. The obvious reply was that in 1793 photography had not been heard of. Counsel then drew attention to amendments made to the same law as recently as 1902, in which photography was not mentioned. The inference was that, a photograph not being

a work of art, no copyright could be claimed by the author. The court, however, decided that in the case of a photographer whose name is well known to the public, "his celebrity is due not merely to his skill in the manipulation of purely mechanical processes, but to the fact that his works bear the mark of personal talent, and constitute, therefore, works of an artistic character." The editor was accordingly sentenced to pay M. Nadar £2 for his picture.—*London Standard*.



The Labor Bureau of the Professional Photographers' Society of New York has been organized and is now in a position to receive applications for employment from efficient workmen who can furnish satisfactory references, and to furnish their addresses to members of the Society desiring help. It will cost a person wishing to register with this bureau a registration fee of one dollar, and for this sum his name will be received and his references carefully investigated. If found worthy, he will be registered and every possible effort made to locate him in a position.

This Labor Bureau is intended to serve as a clearing-house for reliable photographic help, and all members of the Professional Photographers' Society of New York, whether active or associate, are entitled to its help without cost other than the regular membership fee in the Society.

Application blanks may be had by addressing W. I. Scandlin, Manager, Labor Bureau of the Professional Photographers' Society of New York, 345 Sixth Ave., Brooklyn, N. Y.



Some days ago we had a visit from the Rev. Henry Mason Baum, president of the Institute of Historical Research, Washington, D. C. Mr. Baum tells us that there is a movement on foot for the establishment in Washington of a bureau for the storage and preservation of negatives and prints of historical subjects. A building has already been planned which will include an operating room for reproduction work and a storage

capacity for 500,000 negatives. The object of the Bureau is not only to get together negatives of historical subjects but also to supply prints to journalists, authors and collectors. We hope to be able to report further on this notable enterprise in an early issue.



A very satisfactory and complete catalogue of photographic apparatus and supplies comes to us from G. Gennert, 24 East 13th street, New York. Looking over its pages we find many photographic specialties, which, as far as our information goes, cannot be obtained save from this well-known house. Among these specialties we may mention Dr. Albert's "Eos" Collodion Emulsion, the Monitor Studio Register, the Iris Lens Flange for attaching any size of lens to one and the same front board, the Speedway Camera and the Cressy, Passy and Nancy Metal Tripods. Copies may be obtained by sending six cents for postage.



The Photographic Section of the Academy of Science and Art, Pittsburg, will hold its first photographic exhibition September 15 to 23. Entries are limited to workers living within a radius of one hundred miles of Pittsburg, and the object of the exhibition is to give an opportunity to those interested in pictorial photography as a distinct branch of art to exhibit such photographic work as will show artistic feeling and expression.



An attractive catalogue of Cooke Lenses and sundries has been received from Messrs. Taylor, Taylor & Hobson, Ltd., St. James Bldg., New York. This catalogue is noteworthy for the unusual amount of practical lens information which it contains. This includes a chapter on the meaning of the word anastigmat and the advantages of anastigmats over rectilinear lenses. Another note deals with the penalty of using too large an aperture in using modern lenses. The illustrations are as interesting as the text, and every amateur photographer should see the catalogue, copies of which can be had for

the asking. Those writing should also ask for a copy of the little booklet explaining the "Principles of a Lens' Action," by William Taylor. This is a classic in lens literature and deserves the widest possible circulation.



The C. P. Goerz Optical Works notify us that they have been fortunate in securing Messrs. Alphonse Mucha, Alfred Stieglitz and Joseph T. Keiley as judges in their catalogue-cover competition, already announced in these pages and which closes Sept. 30.

Messrs. Stieglitz and Keiley are too well known to our readers to need further introduction. Mr. Mucha is a painter of reputation, for many years director of the Parisian art school bearing his name, and a recognized leader in decorative art and poster designing.

Altogether, the board of judges is as desirable as the most critical competitor could want, and we would again direct the attention of our readers to this competition as well worthy of their serious attention.



The business of H. A. Hyatt, St. Louis, heretofore existing as a private ownership of H. A. Hyatt, has been incorporated under the laws of the state of Missouri as the H. A. Hyatt Supply Co., with a capital of \$50,000, fully subscribed and paid up. This step involves no deviation in the conduct of the affairs of the company or change of ownership, but has been taken with a view of meeting such contingencies as may arise through death or other cause. H. A. Hyatt, the proprietor for the past thirty-seven years, continues as president and treasurer of the new company, and Harry H. Hyatt, connected with his father in the business since 1889, will act as vice-president and secretary.

Few firms in the photographic business are more widely known or respected than the house of H. A. Hyatt, St. Louis. Those of our southern and western readers who are not yet acquainted with the facilities of the firm should send for the last general catalogue, which gives a comprehensive survey of the specialties controlled by the firm.

In our brief note on the new edition of Lloyd's *Photographic Encyclopædia*, 1905, on page 624 of our last issue, we neglected to call the reader's attention to the important fact that in this year's edition of this well-known reference book the discount sheet has been abolished and all the prices given are marked down upon a new net basis, which gives the customer the lowest possible price at which each item can be purchased. The convenience of this system of pricing must be seen to be appreciated. Since writing the earlier note, we have again looked through this wonderful volume and would again commend it to our readers as a genuine treat, by reason of its varied information and the interesting way in which this information is given. A copy can be obtained free by those who will write the publishers and mention THE PHOTO-MINIATURE.



Messrs. Burke & James, of Chicago and New York, advise us that they have been appointed sole United States agents for the Watkins Meter Co. of England. The practical usefulness of the Watkins Exposure Meters for negative-making and printing is widely known and appreciated, but there has been some difficulty in the past in obtaining supplies in this country or of getting information as to the different specialties of the Watkins Co. Messrs. Burke & James now offer to send a complete list of the Watkins specialties on request. Their first popular introduction is the Watkins Bee Meter, which is priced at \$1.25, although heretofore sold at a much higher figure. This is the simplest of the Watkins Meters, easy to manipulate and giving the exposure required for any desired subject at a glance. It is in size and appearance exactly like an ordinary watch. We hope to report on our experience with this particular meter in our next number.



There are many evidences that the focal plane shutter is coming into wide popularity on this side of the Atlantic. At the Boston convention we had an opportunity of seeing the three different focal plane shutters

available, viz., the Century Curtain Slide Shutter, the Folmer & Schwing Focal Plane, and the Thornton-Pickard Focal Plane, new model. The efficiency of these, as compared with the ordinary diaphragm shutter, is truly remarkable, and their usefulness for other than ultra-rapid exposure work is not yet sufficiently appreciated. We urge our readers to send to the manufacturers of these three shutters and inform themselves of the added capacity they offer for many kinds of outdoor work with the camera. The Century Curtain Slide Shutter is made by the Century Camera Co., of Rochester, N. Y.; the Folmer & Schwing Shutter by the Folmer & Schwing Mfg. Co., 407 Broome St., New York; and the Thornton-Pickard Shutter is obtainable from the American agents, Andrew J. Lloyd & Co., 315 Washington St., Boston.



A dainty booklet titled *Scandlin's Business Brieflets* comes to us from W. I. Scandlin, 345 Sixth Ave., Brooklyn, N. Y. It is designed to show by its attractiveness, as well as by the argument of its text, the very practical advantages possessed by a business booklet when properly written and gotten up in a tasteful manner. Mr. Scandlin's booklet fits the ordinary envelope and is printed in two colors, with cleverly designed borders and a portrait frontispiece, the whole being enclosed in a parchment cover with embossed title. Photographers seeking a suggestion as to the best way of presenting a high-class specialty to possible customers should not neglect to obtain a copy of this booklet, with a quotation from Mr. Scandlin.



The New York Lens Co., 1133 Broadway, New York, announce a new roller-blind shutter, the O-H-P, with several improved features. The O-H-P will work on the hood or at the rear of the lens, sets with a key instead of the usual cord, and can be used with different lenses. A descriptive circular can be had on request to the manufacturers.



FIG. 2

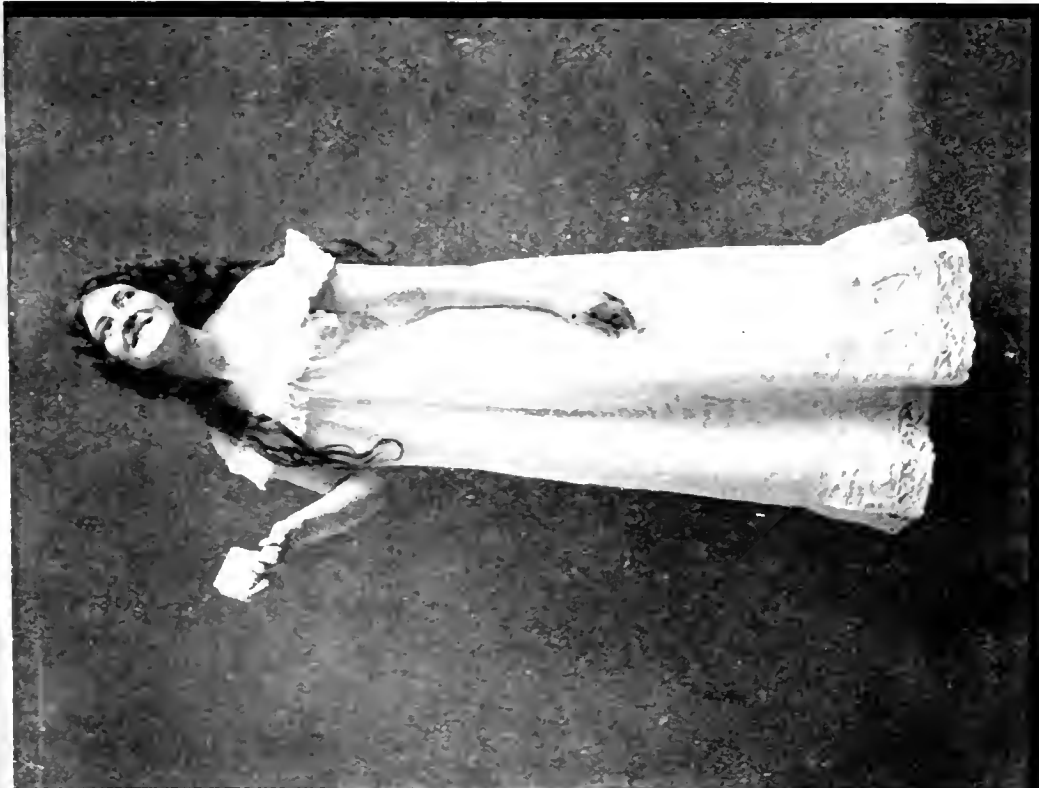


FIG. 3

Suggestions for soap advertisements



FIG. 8

Another attractive soup advertisement

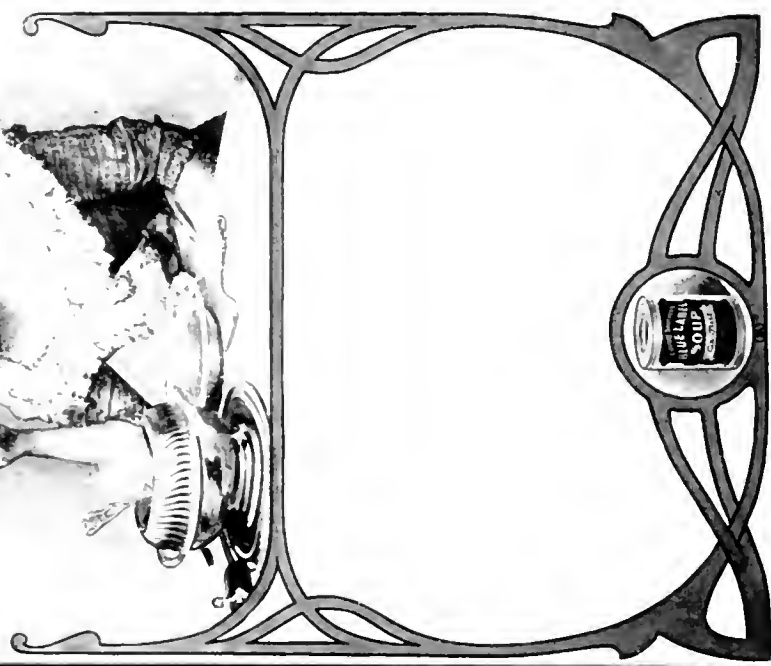


FIG. 9



FIG. 18

In this advertisement of a home fire-extinguisher the figure was first secured and, later, combined with a wash drawing of the interior, effectively showing the actual use of the article advertised.

The white spaces here and above are left blank for advertising matter.

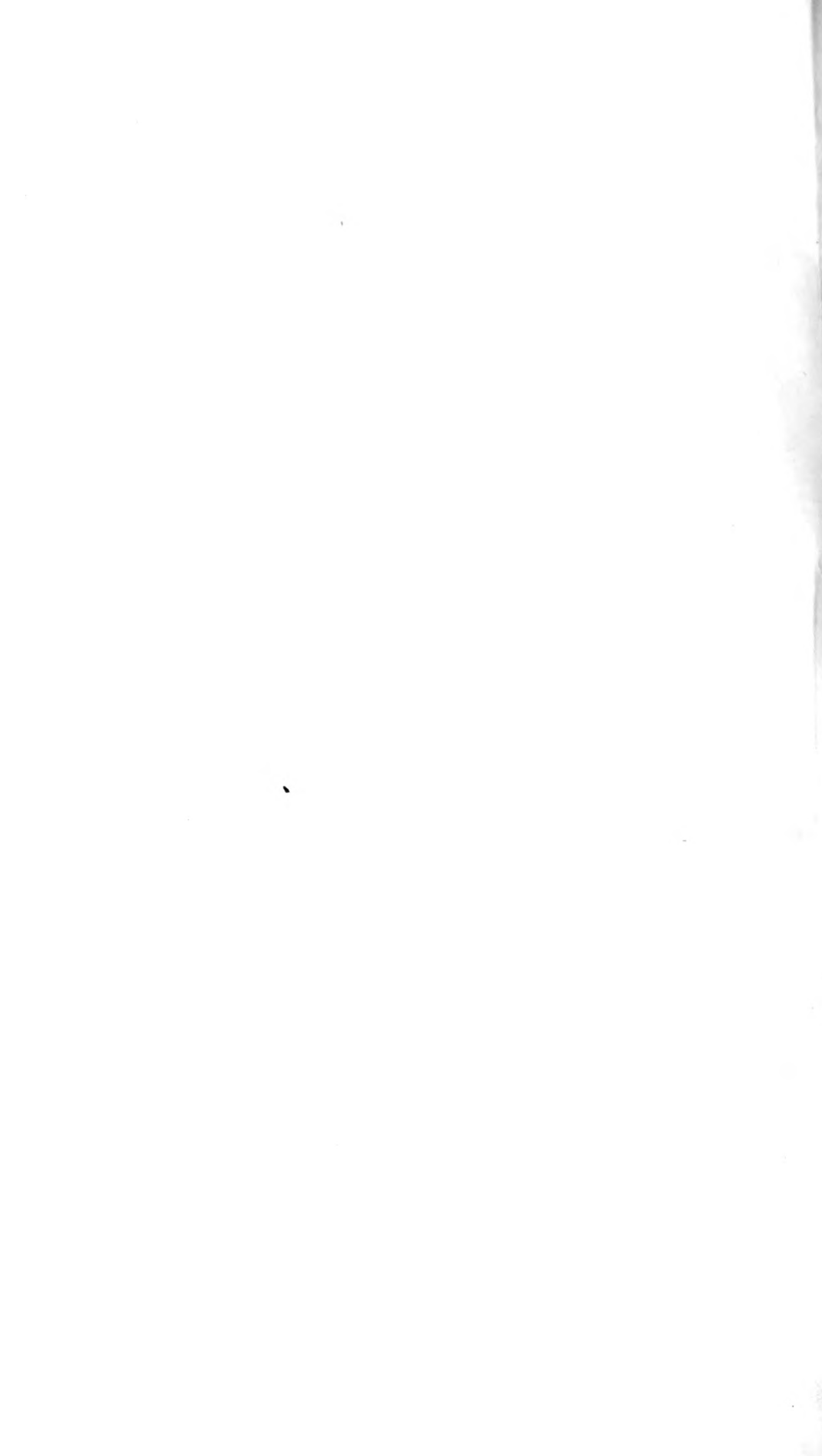




FIG. 19

Photographs of this sort are always readily salable for calendar and high-class advertising purposes



FIG. 20
Another example of calendar illustration



FIG. 22

Showing how the photograph is "worked up" for calendar illustration

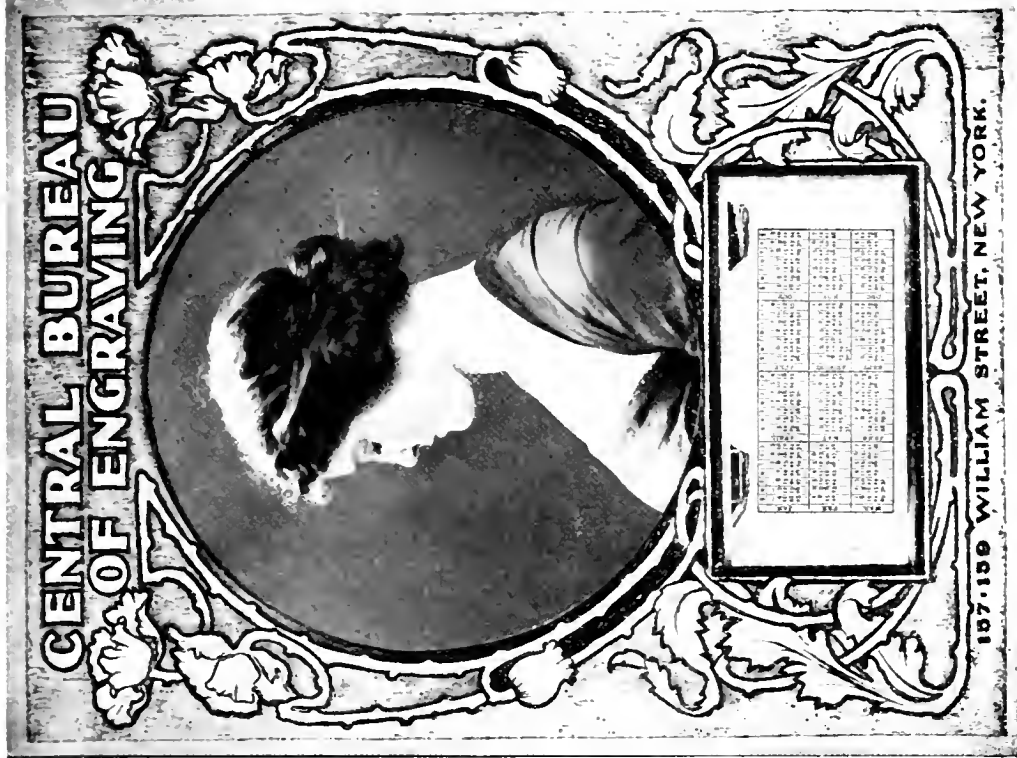


FIG. 23





FIG. 1



FIG. 2



FIG. 3

Three average solutions of the two-figure group

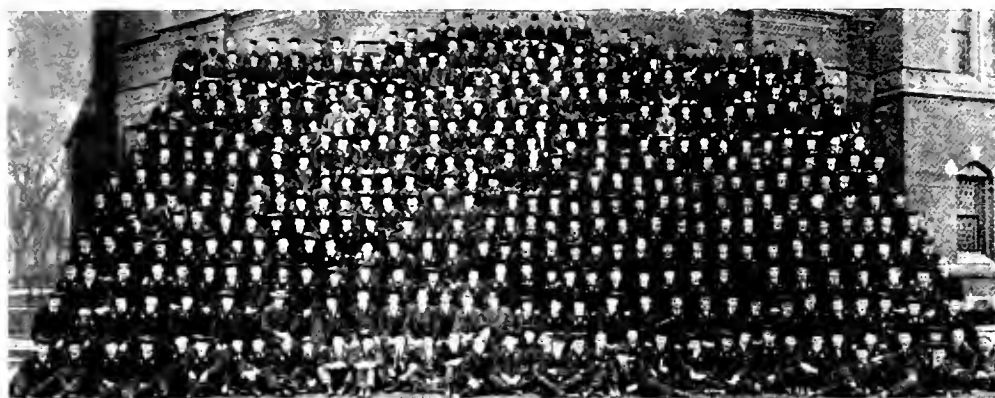
PLATE VII



FIG. 1
The Consultation: Gérôme



FIG. 2
The Schism: Vibert



1. Princeton

2. Harvard

3. Yale

4. Columbia

PLATE IX

The college group



FIG. 1
The Homage of Venice: Makart



FIG. 2
Return from the Battle of Salamis: Cormon



PLATE II. Pinhole photograph for comparison with Plate III lens photograph



PLATE III. Lens photograph for comparison with Plate II pinhole photograph





FIG. 1. A suggestion likely to interest advertisers of candies
Joseph H. Adams



FIG. 10

Suggestion for a chocolate advertisement

"When I go traveling, Mama always lets me take a cake of Peter's Milk Chocolate. It's my favorite."





LITTLE PEASANT GIRL
Jeanne E. Bennett



LISTENING TO THE LARK

Jeanne E. Bennett



KNITTING GIRL
Jeanne E. Bennett



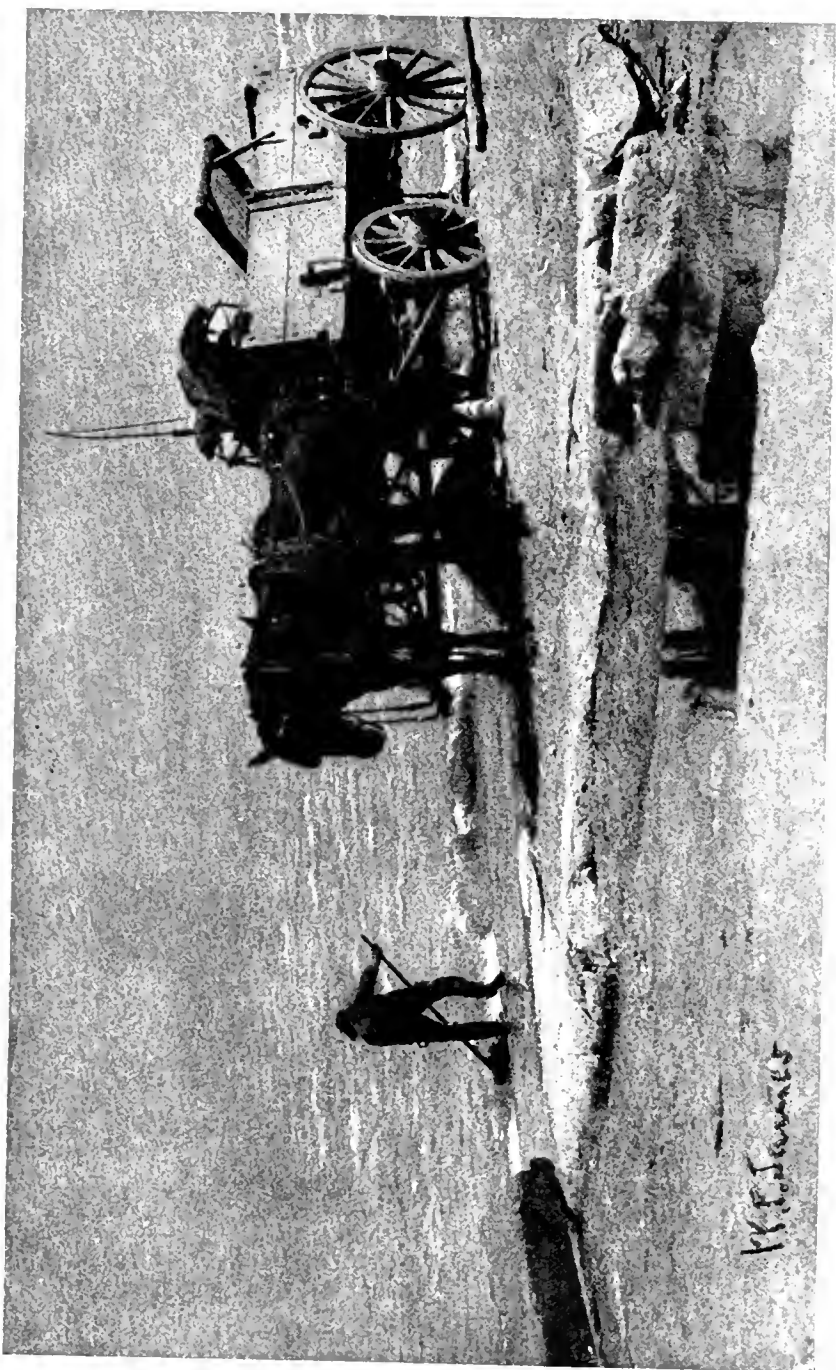
KOTO PLAYER
Herbert G. French



LA FILLE AU CAPUCHON

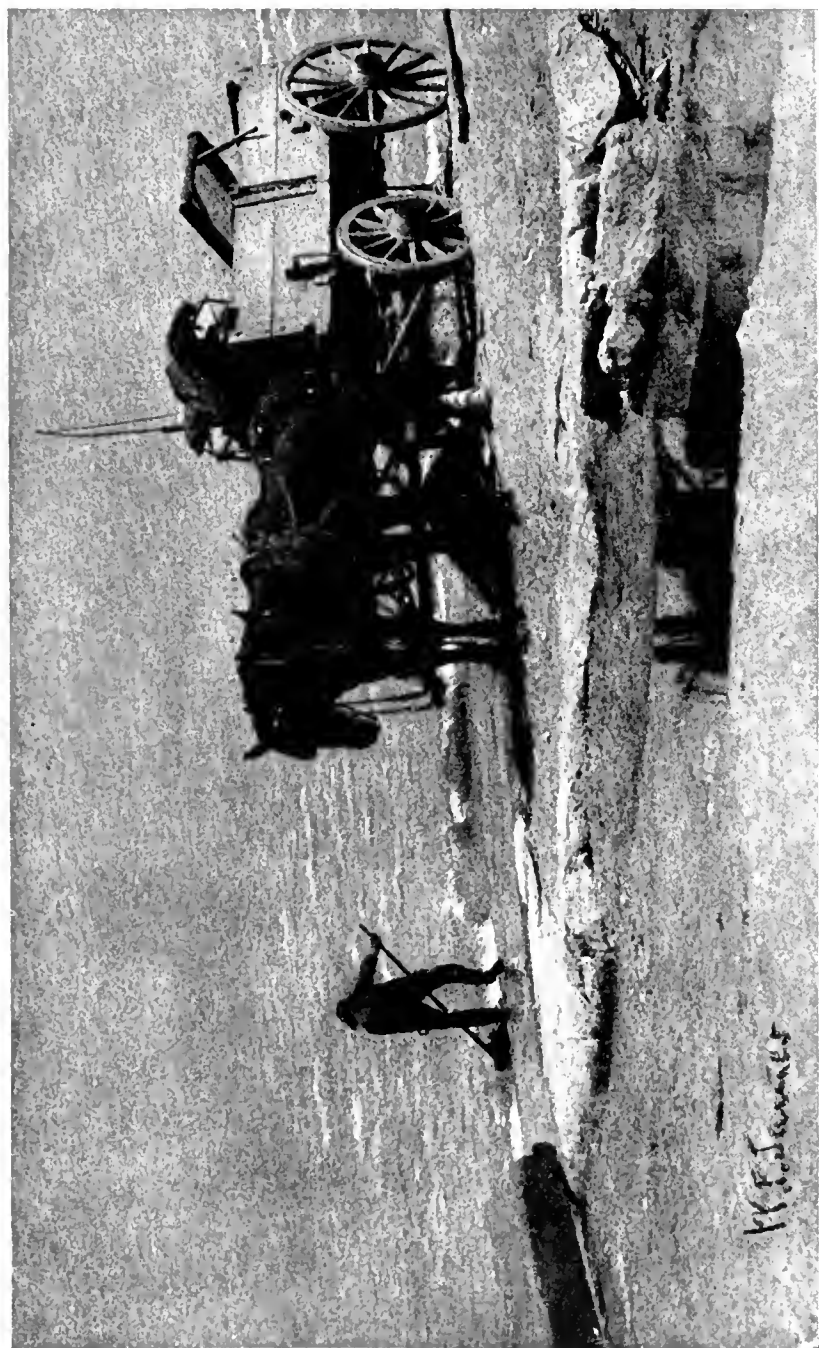
Jeanne E. Bennett





THE GRAVEL MAN
W. F. James





H. F. J. J. J. J.

THE GRAVEL MAN
W. F. James



Robert Demachy



Robert Demachy



CHRISTMAS SHOPPING

W. F. James



TUESDAY
W. F. James



SNOW-STORM: NEW YORK

Dr. L. M. Homburger



A MISTY NOVEMBER MORNING

Jeanne E. Bennett



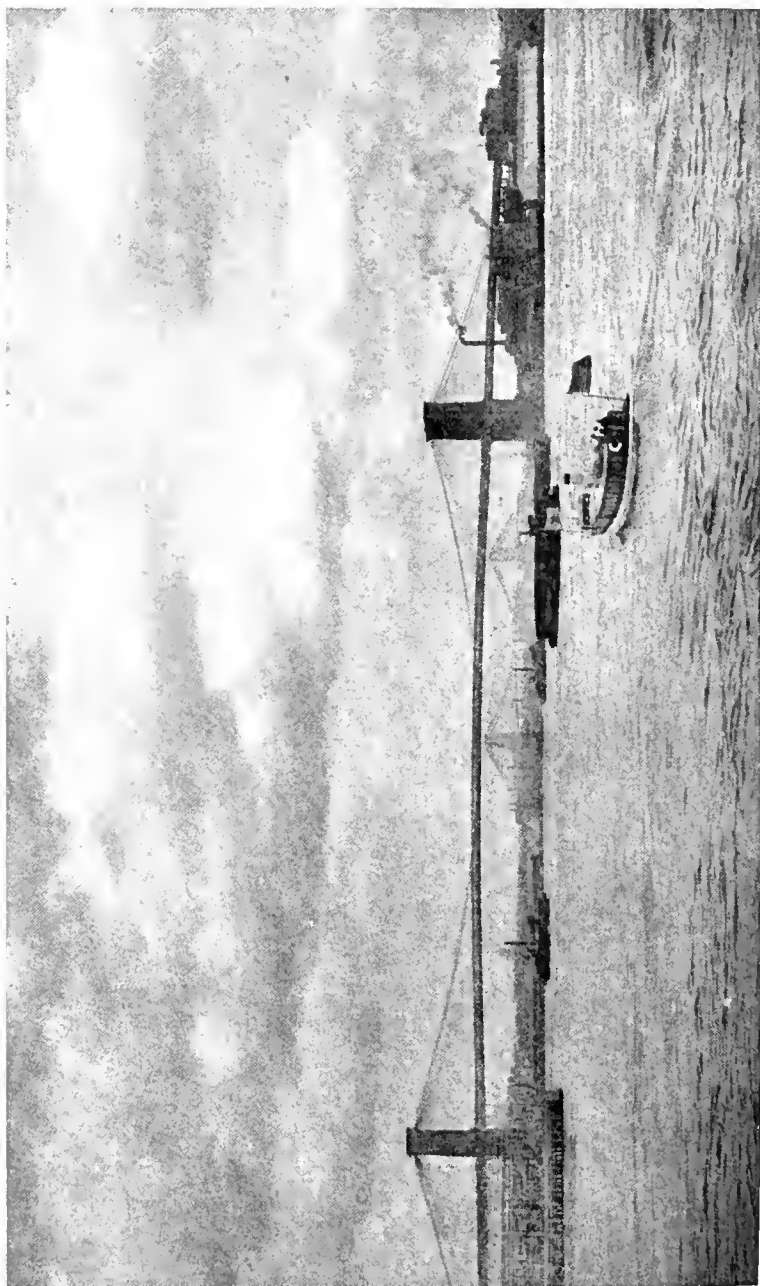
A POOL IN THE ROAD
Jeanne E. Bennett



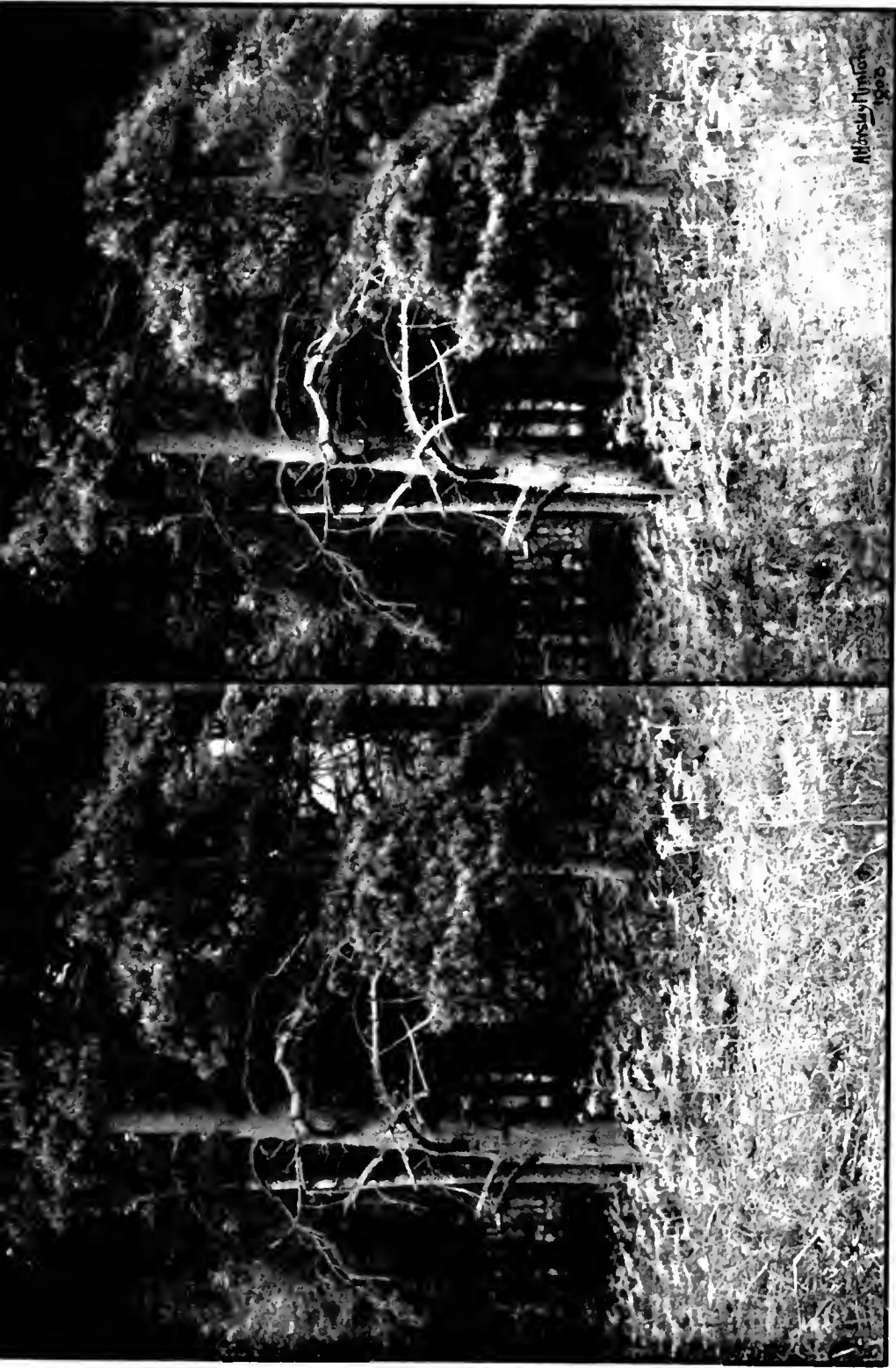
THE DRAWING LESSON
Edmund Stirling



MELODY
W. H. Wallace



BRIDGES ON THE EAST RIVER, NEW YORK
W. H. Wallace



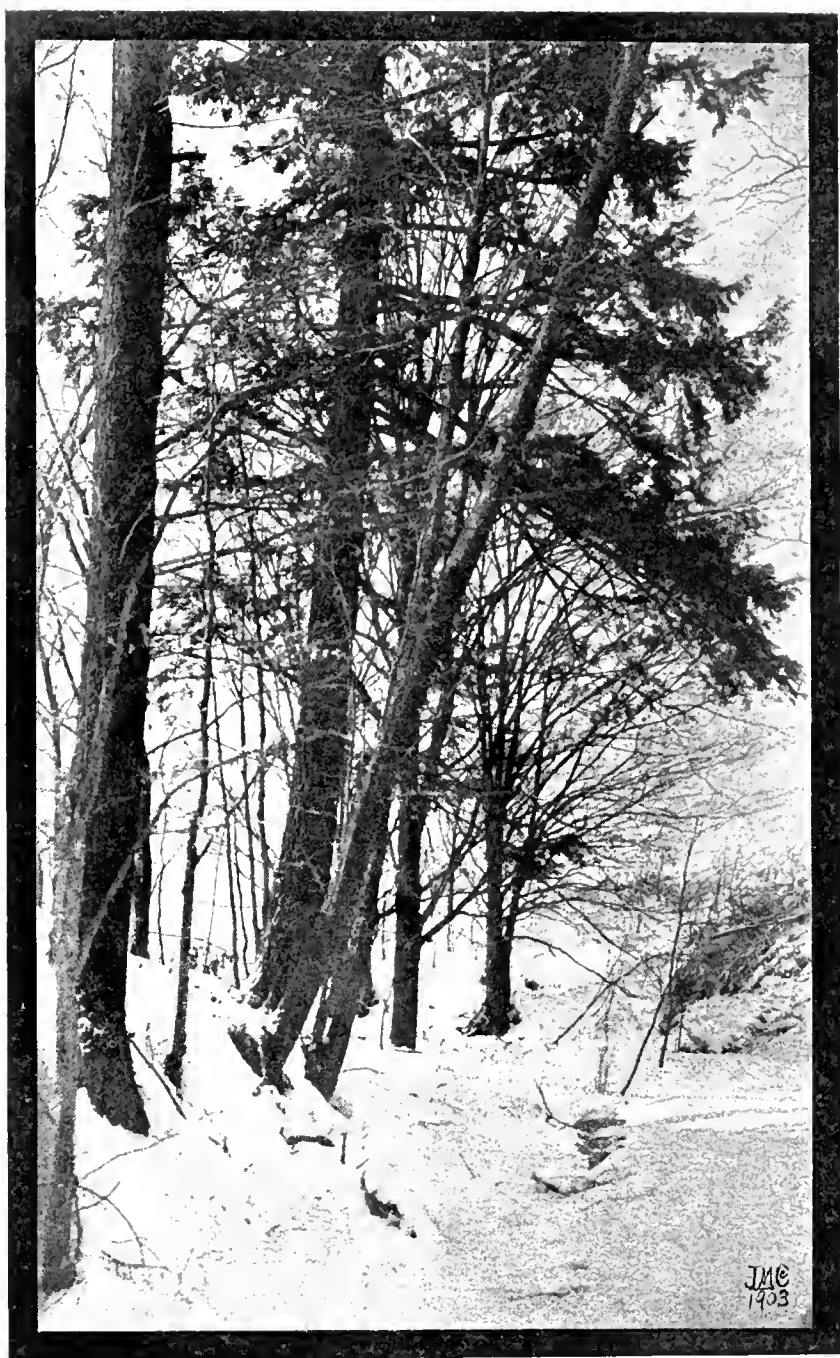
A. Horsley Hinton
1908



FIG. 15



FIG. 16



WINTER
J. H. McCorkle



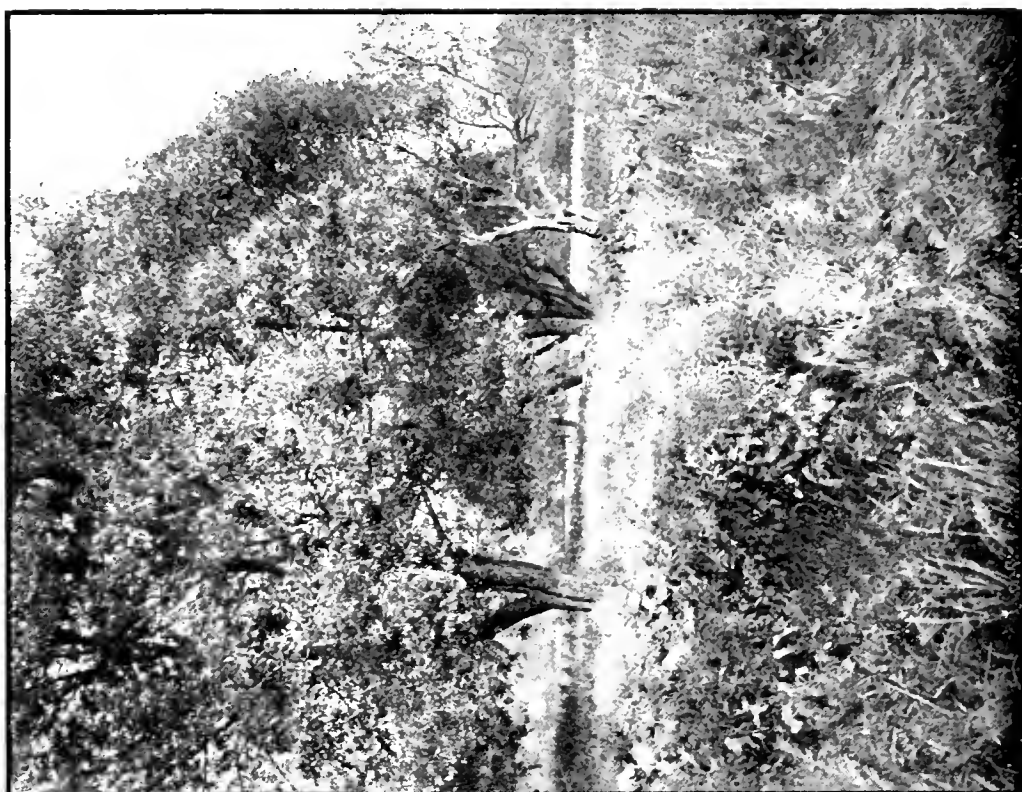
FIG. 5
A. Horsley Hinton



FIG. 13



FIG. 14





Lucy Bull Bear
An Indian Reservation School Maid
Pine Ridge Agency, South Dakota
Edward Truman



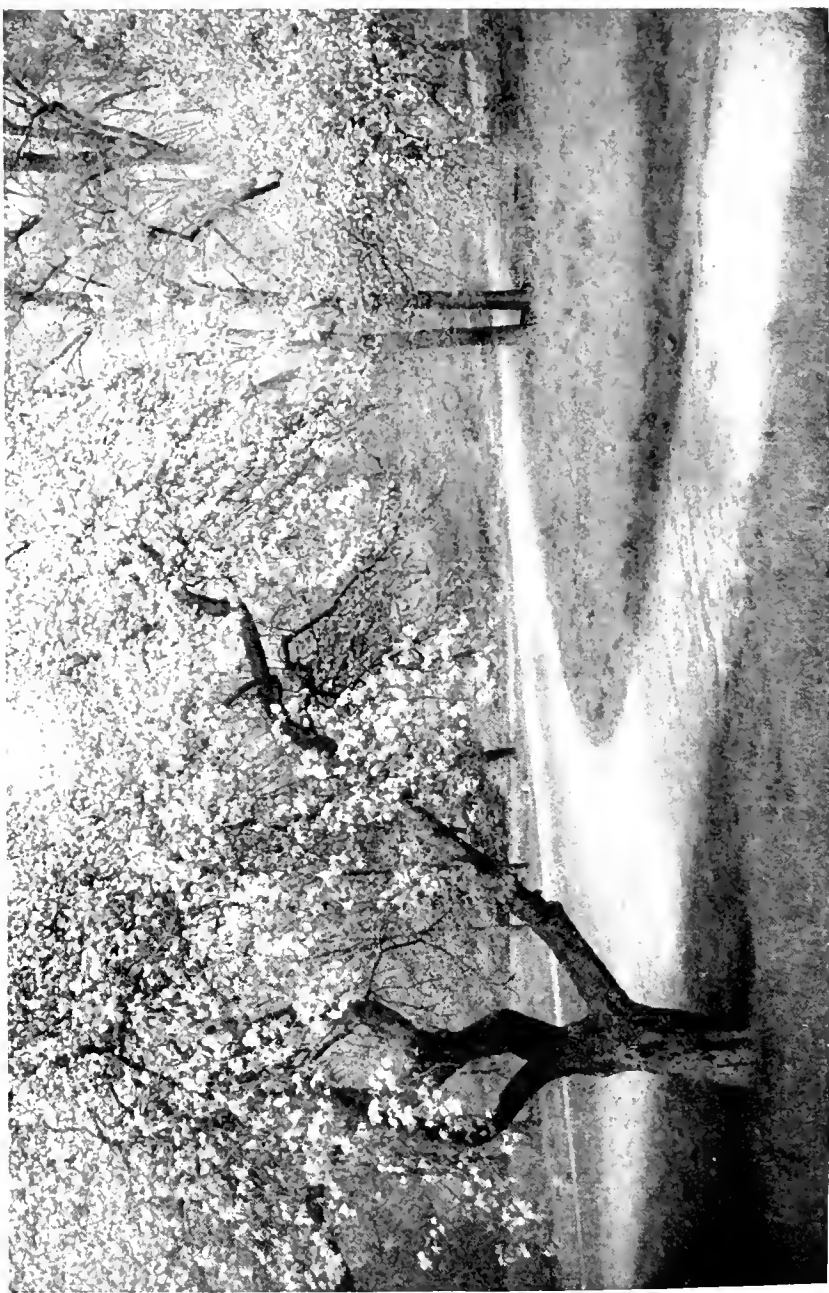
Indian woman preparing dog for "Dog Feast," July 4
Pine Ridge Agency, South Dakota
Edward Truman



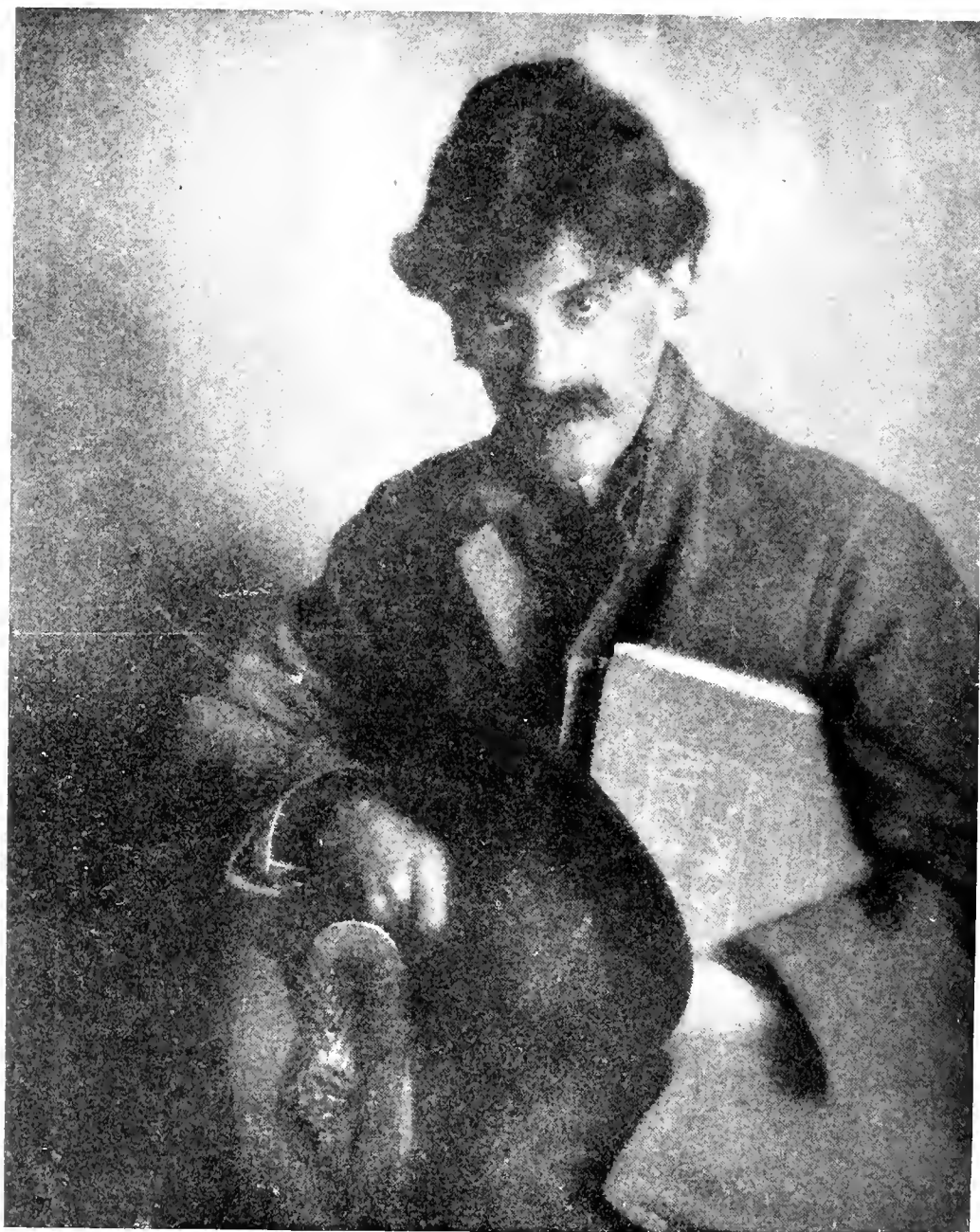
CHUMS
Henry Hall



FEBRUARY
W. H. Wallace



W. H. Wallace



PORTRAIT OF ALFRED STIEGLITZ
Alvin Langdon Coburn



F. Holland Day

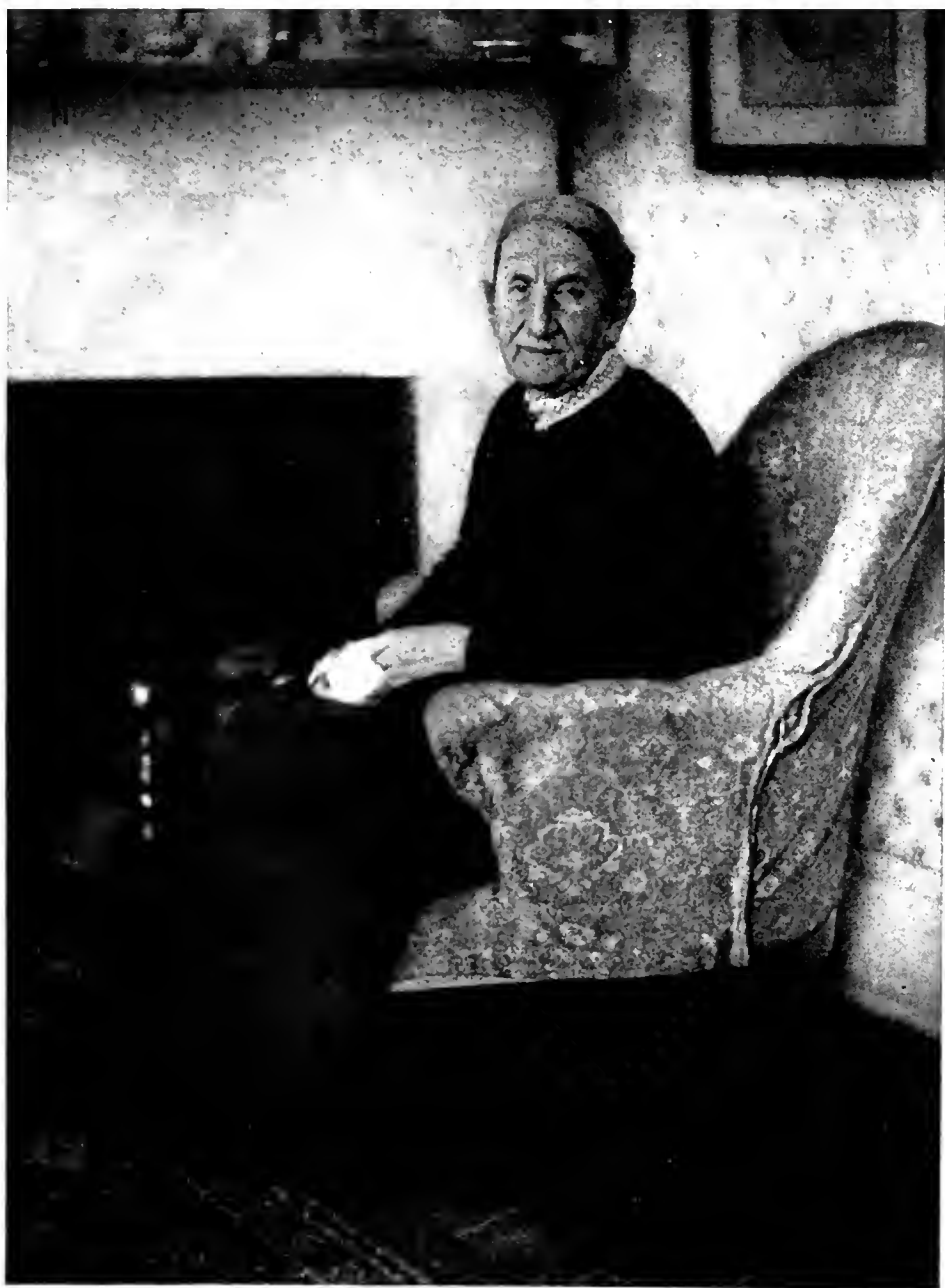


HEIMWEH
Myra Albert Wiggins

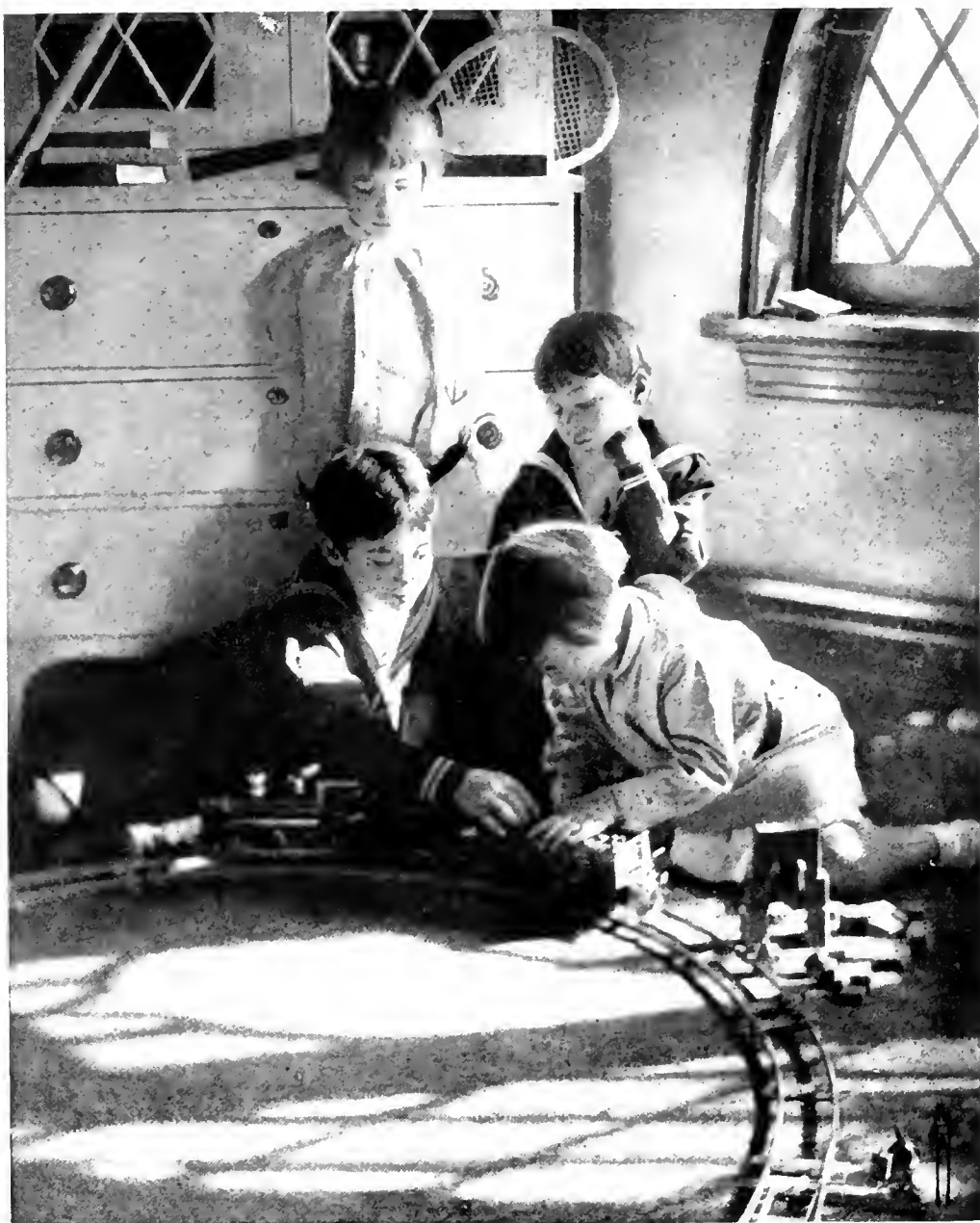


JACKSTRAWS

From a platinotype 5 x 8, on a dark gray mount
Mathilde Weil



PORTRAIT: MRS. G.
From a platinumotype 6 x 8½
Mathilde Weil



OFF THE TRACK
From a platinotype 6 x 8
Mathilde Weil



THE EDGE OF THE CLIFF
Myra Albert Wiggins



STATUE TO DAGUERRE

In the grounds of the National Museum, at Washington, D. C.
Erected 1900, by the Photographers' Association of America



PORTRAIT OF A BOY
Clarence H. White



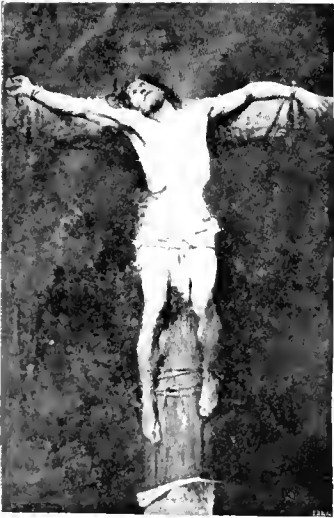
THE ESTHETE
Sarah C. Sears



*Copyright, 1903, by Collier's Weekly, N. Y.
By permission of Collier's Weekly*

PLATE I

Four examples of the vertical subject from the art of John Sargent



Figs. 1 and 2

Figs. 3 and 4

Figs. 5 and 6

PLATE II

Other suggestions from the vertical



FIGS. 1, 3 and 5

FIGS. 2, 4 and 6

PLATE III
The pyramidal figure



FIG. 1
The Dice Throwers



FIG. 2
The Chess Players



THE BUFFOON: VELASQUEZ



PLATE V
The figure as rectangle



Decorative Panel by Robert Demachy

PLATE VI

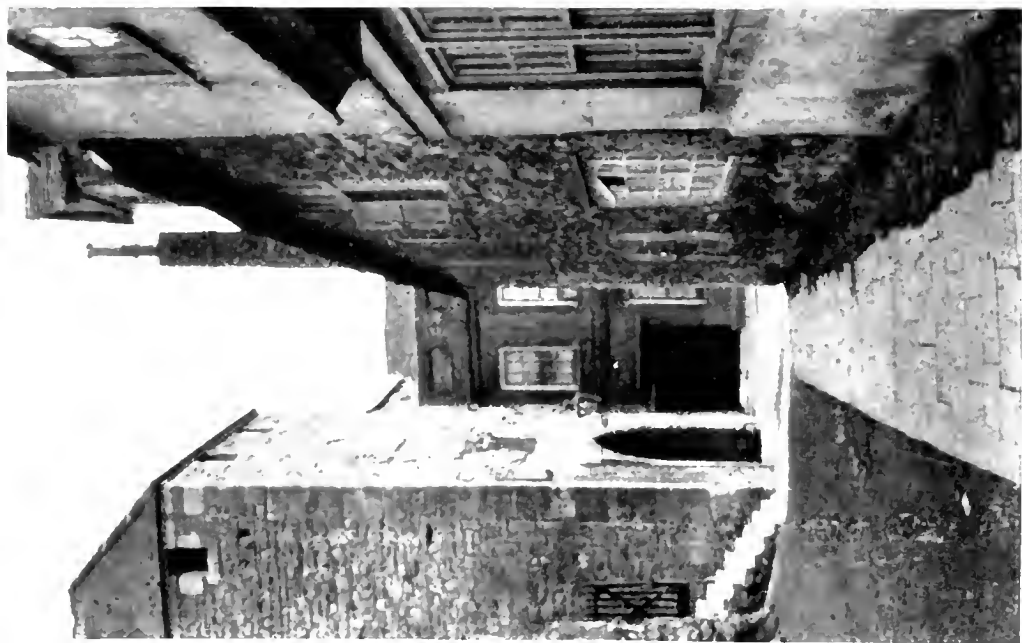


PLATE XI. See page 540



PLATE XII. See page 540

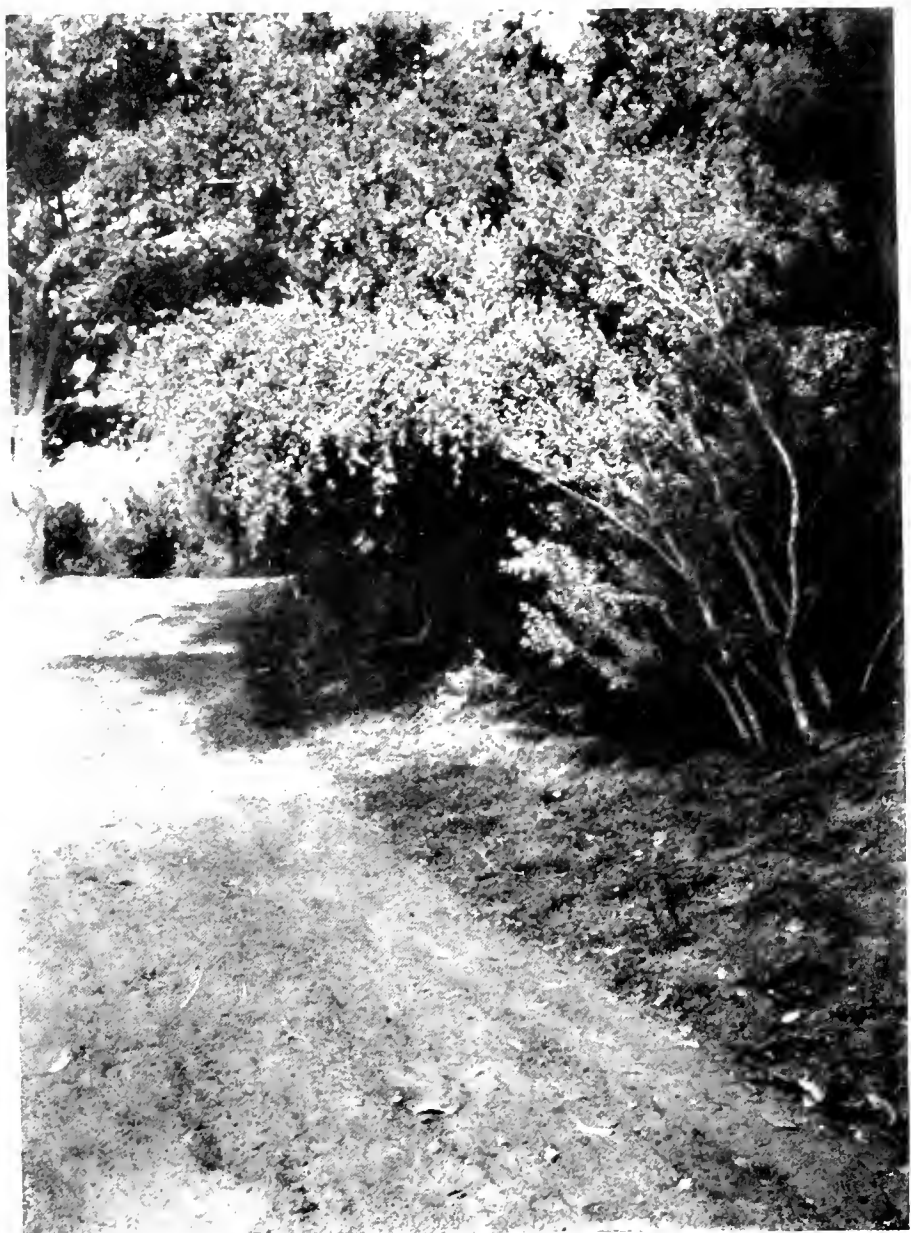


PLATE XIII. Pinhole No. 3. See page 541



PLATE XIV. Illustrating sunlight effects, page 541

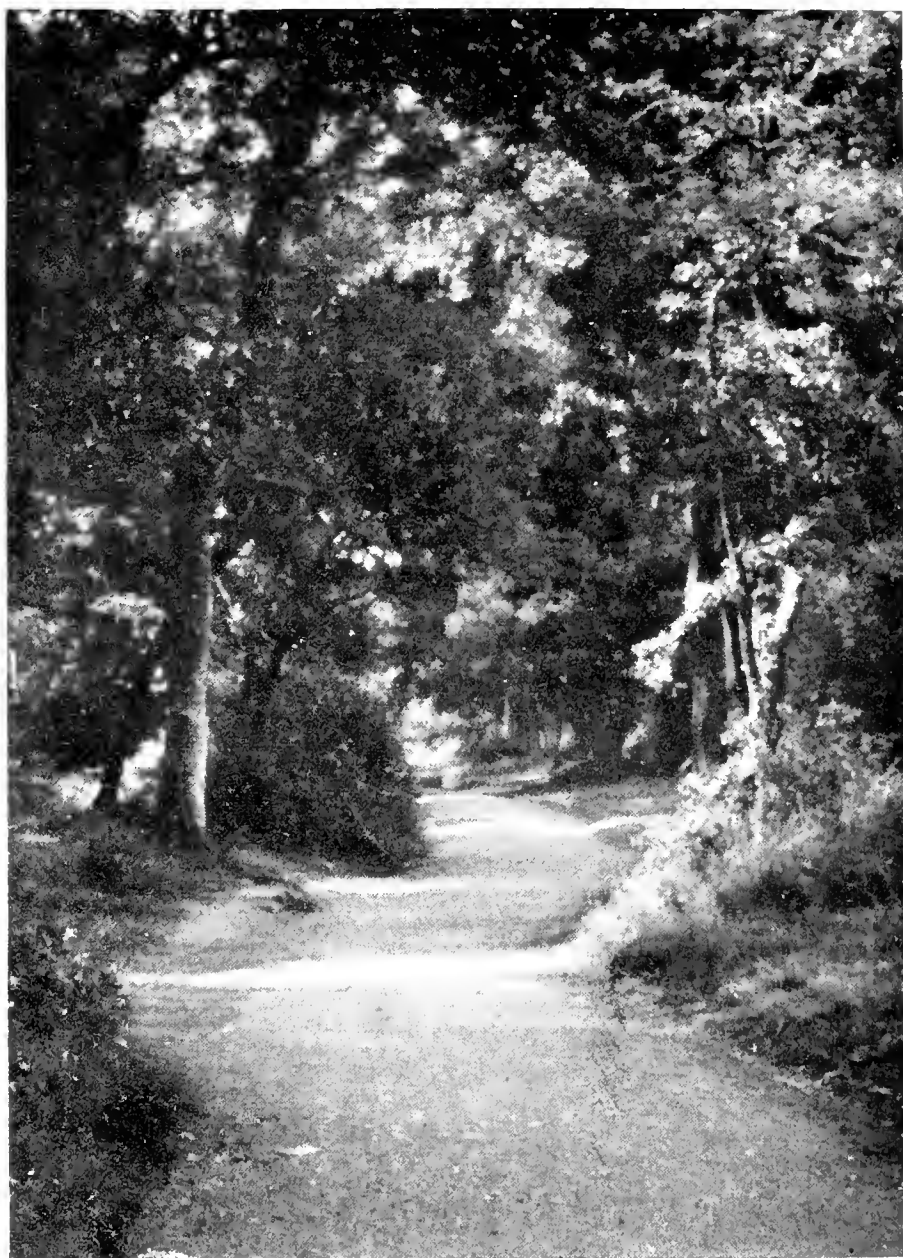


PLATE XV. Made with a No. 2 pinhole, page 541



PLATE XVI. Made with pinhole No. 2. See rendering of
sunlight, page 542



PLATE XVII. Made with No. 2 pinhole. See page 544



PLATE XVIII. Made with pinhole No. 2. Exposure 10 sec.

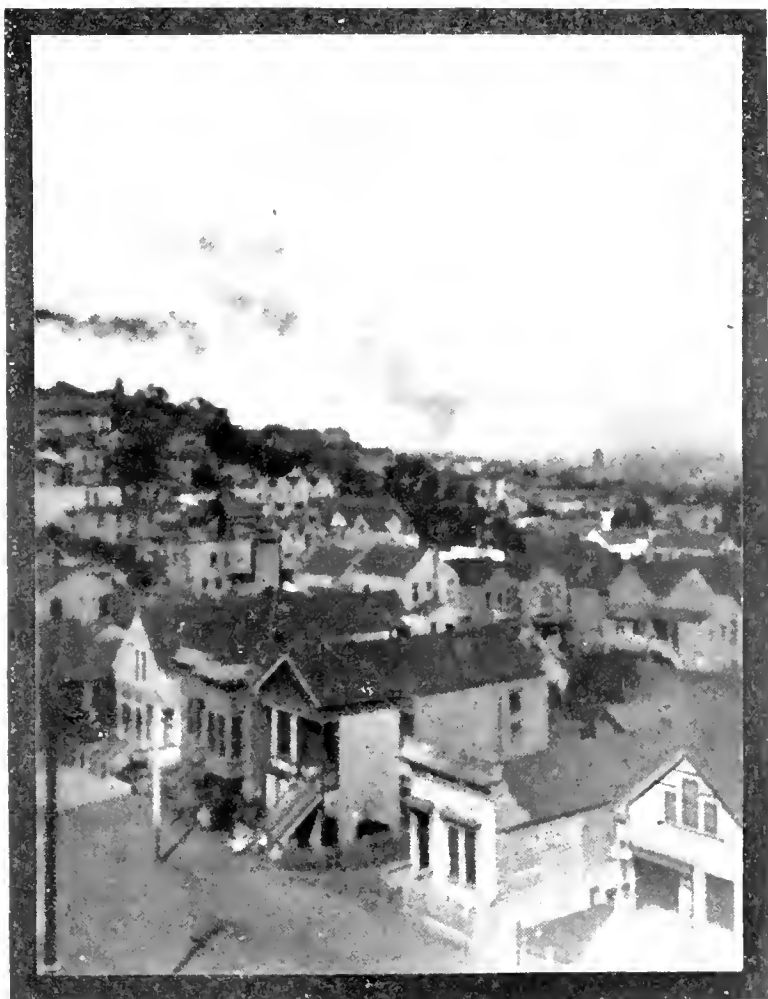


PLATE XIX. No. 3 pinhole. Exposure $\frac{1}{8}$ sec.



Home Portrait, by J. W. Little. See page 560
Flashlight exposure, developed by Wallace Method



WOODLAND AND STREAM



PLATE IV. Illustrating the absence of halation in pinhole photographs. See page 520.

PLATE X illustrates the correctness of the exposure rule devised by Dr. Power. See page 537.

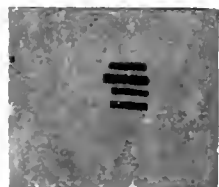
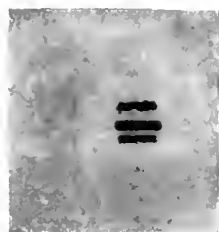
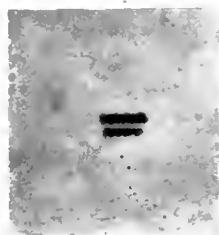
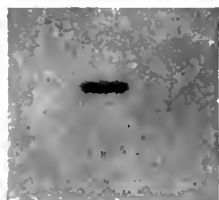
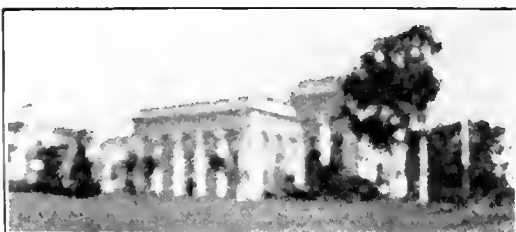


PLATE X

V



Taken with
View-finder
Aperture
3 mm.

VI



With
Aperture
No. 1
1 mm.

VII



With
Aperture
No. 2
0.75 mm.

VIII



With
Aperture
No. 4
0.375 mm.

IX



With
Aperture
No. 5
0.25 mm.

PLATES V-IX. Illustrating the images given by different apertures. See page 532. Much of the detail of the originals is lost in reproduction. Thus the original of Plate IX is as sharply defined as a lens picture at $f/16$.





AN INDIAN CAMP
F. S. CURTIS



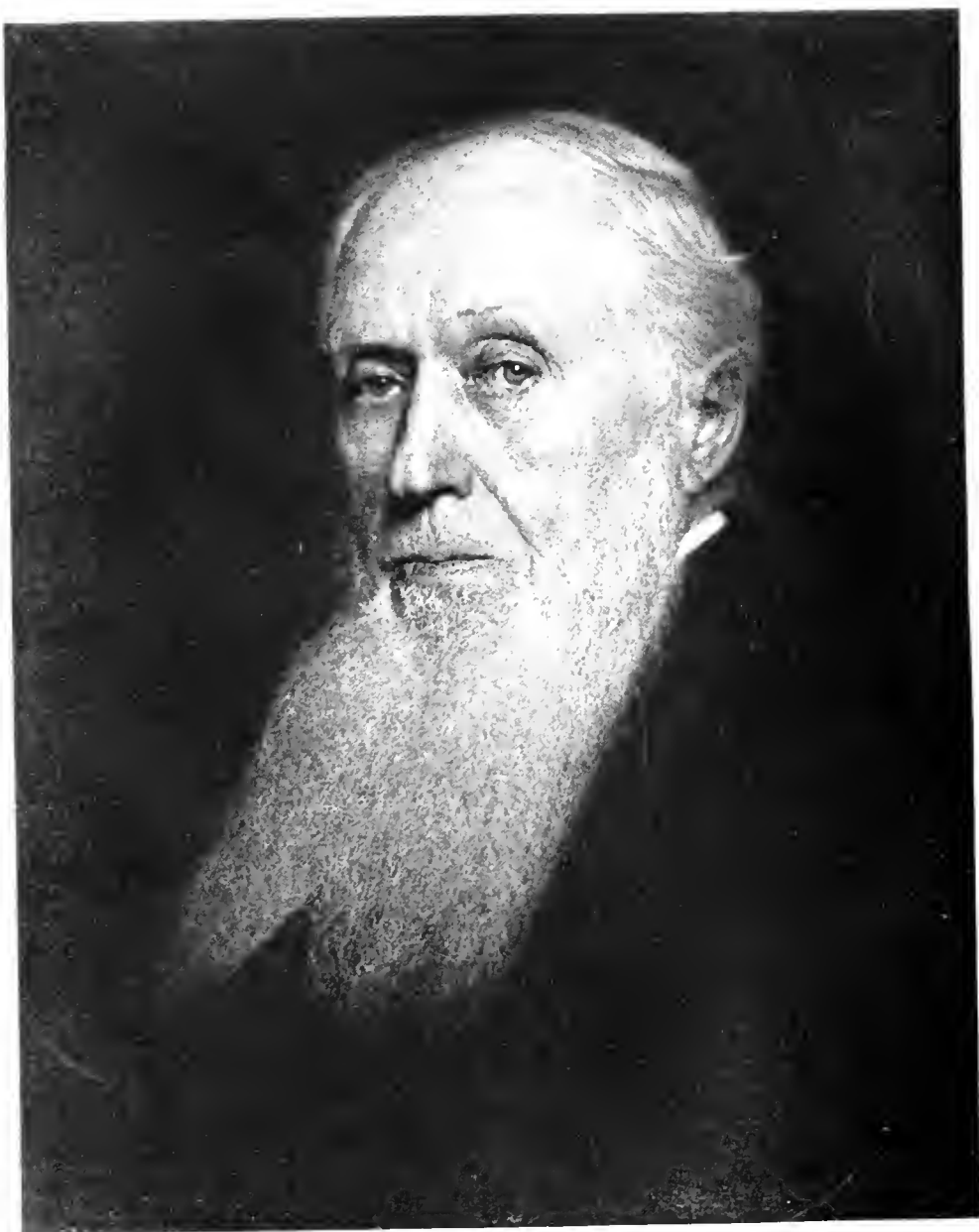
THE HOPI SNAKE PRIEST
E. S. Curtis



A ZUNI TYPE
E. S. Curtis



IN NAVAHO LAND
Copyright, 1904, by E. S. Curtis



ABRAHAM BOGARDUS. JUNE, 1905
W. M. Hollinger



A STREET IN PARIS
R. L. Sleeth, Jr.



A BROOK IN SUMMERTIME
W. H. Wallace



A WINTER'S DAY ON FIFTH AVENUE, NEW YORK
John Beeby



CHARACTER STUDY
A. Tauxe



IN HAY-TIME
A. Tauxe

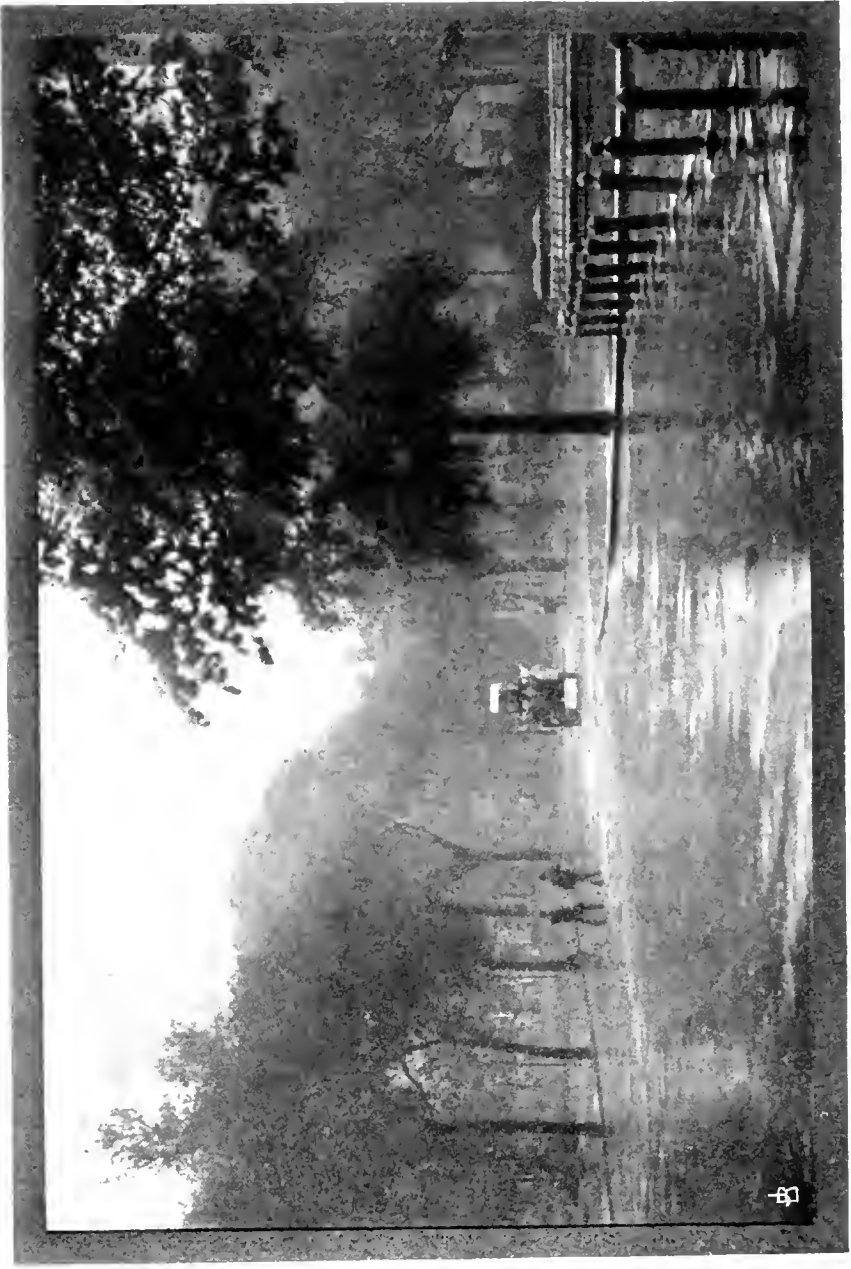


FEBRUARY
A. Tauxe

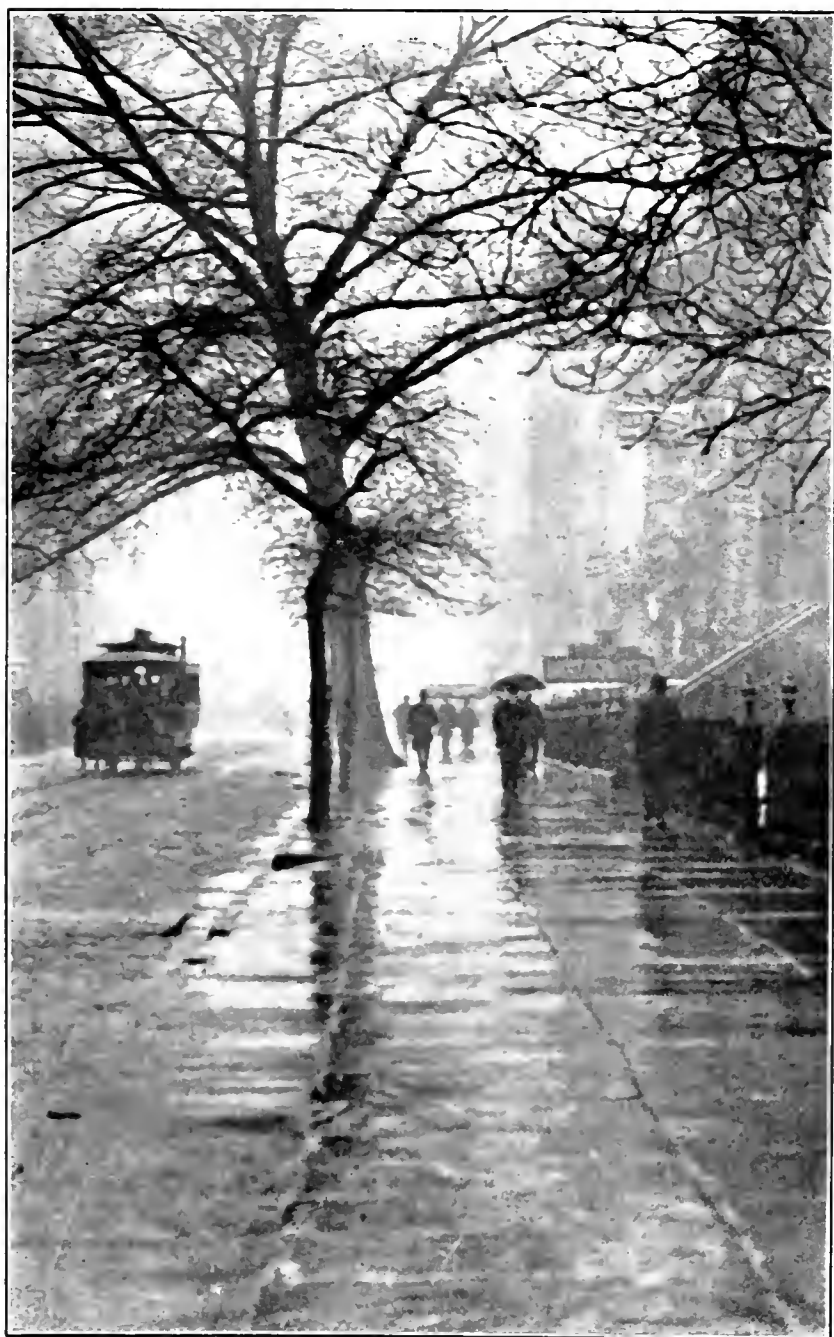


CRYPT: DURHAM CATHEDRAL

John Reece

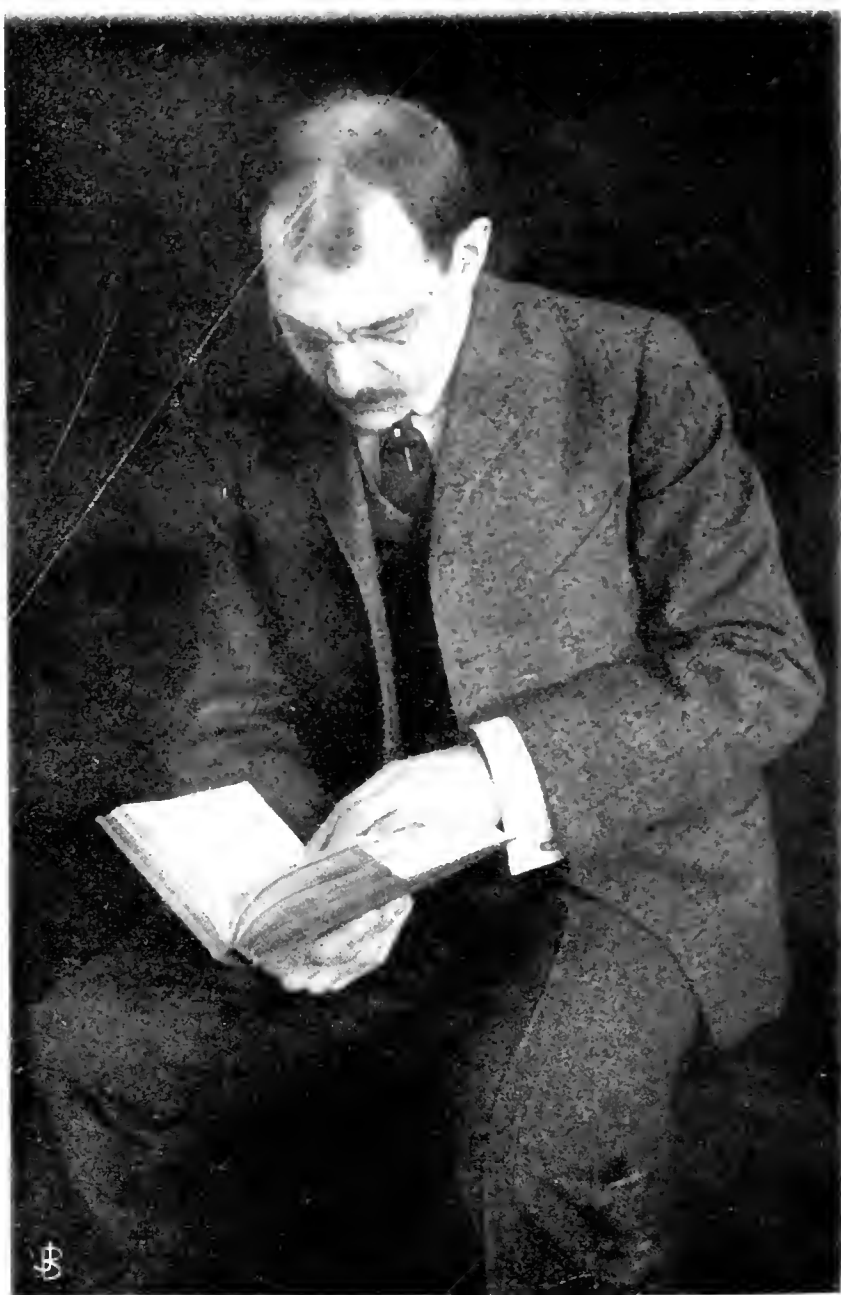


A WET DAY IN WASHINGTON PARK, NEW YORK
John Beeby



WET, FOGGY DAY: NEW YORK

John Beeby



HOME PORTRAIT
John Beeby

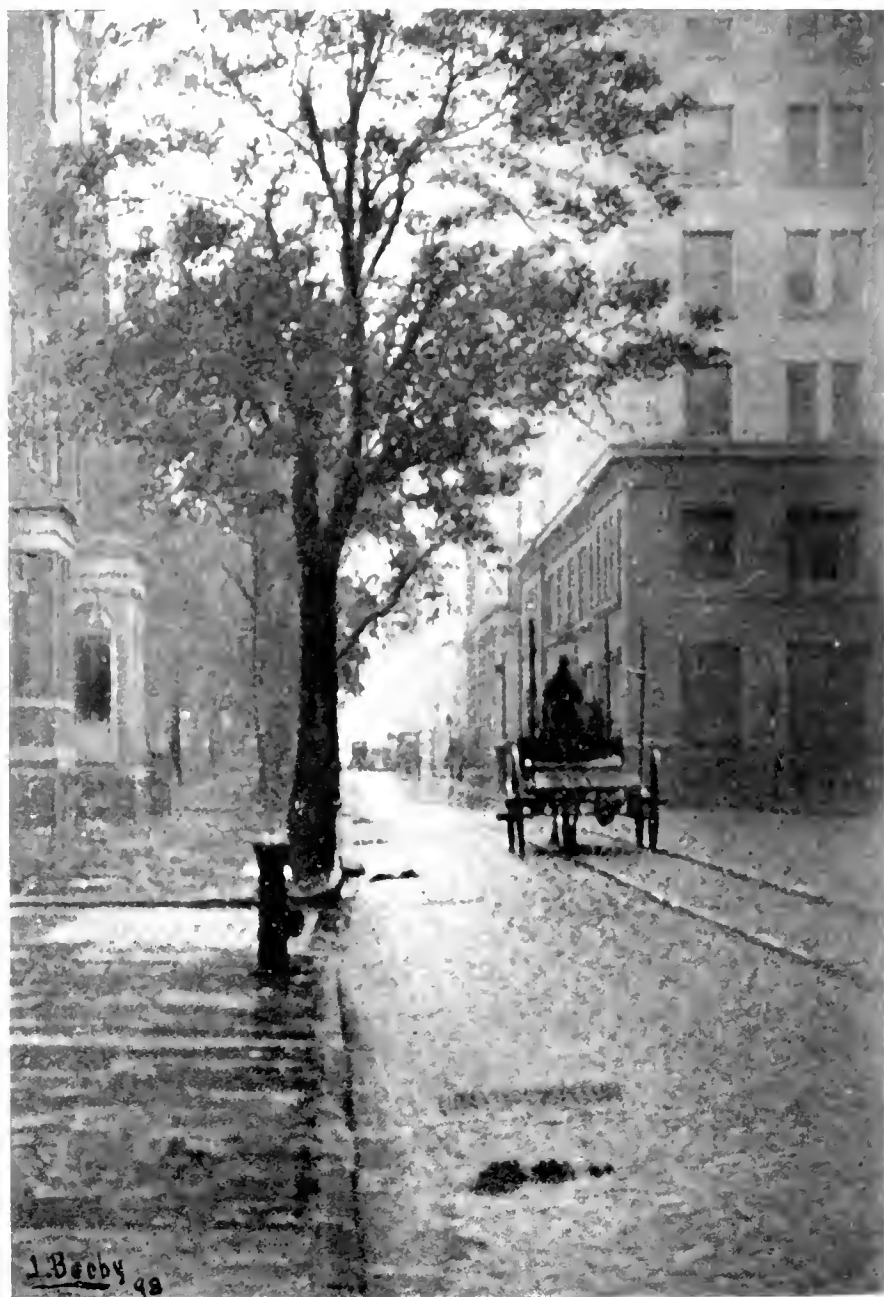




WET WEATHER: UNION SQUARE, NEW YORK
John Beeby



AN ENGLISH FARM SCENE
John Beeby



John Beeby



AFTER THE STORM
John Beeby



BABES BY THE WAYSIDE
John Beeby



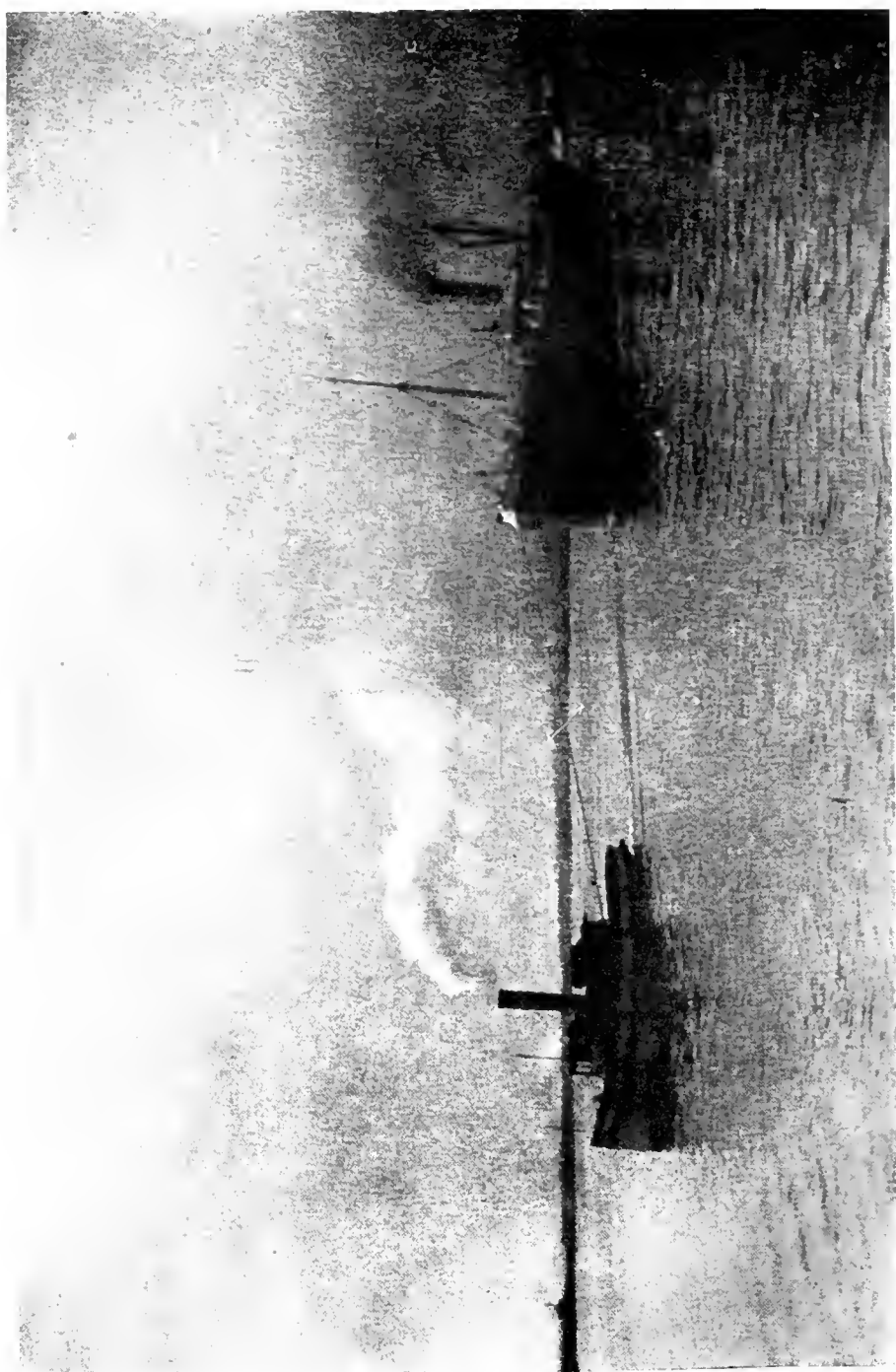
EIGHTH AVENUE, NEW YORK
John Beeby



HOMeward
John Beeby



THE WAVE
F. H. Thompson
First American Salon



TOWING IN
George L. Bean
First American Salon



SUNLIGHT IN THE WOODS
Curtis Bell



PORTRAIT





DECORATIVE EFFECT OF FRINGED GENTIAN
ON PANEL

J. Horace McFarland Company



From a sepia print 5 x 8, on a warm gray mount
Mathilde Weil



From a sepia print 6 x 8, on parchment
Mathilde Weil



1. By a window, with reflector
2. By the side of a house, with an opaque screen
3. On the veranda, with opaque screen
4. On the veranda, without screen or reflector

Gaston M. Alves



1. A portrait "taken unawares"
 2. Showing the use of the veranda for portraiture
- Gaston M. Alves



Original a sepia print 5 x 7, on a warm brown mount
Mathilde Weil



From a platinotype 7 x 9, on a warm gray mount
Mathilde Weil



A SCHOOLBOY

Original a warm toned sepia 6 x 8
Mathilde Weil



A YOUNG ARTIST
From a platinotype 6 x 8
Mathilde Weil



PORTRAIT
Rudolph Eickemeyer, Jr.



PORTRAIT OF MASTER GERALD PHILBIN
Rudolph Eickemeyer, Jr.



THE BALLOON
Adelaide Hanscom



IN THE FOG — SCHEVENINGEN

M. L. and E. H. Tracy

First American Salon



FIG. 24

These pictorial subjects are equally desirable for magazine or book cover designs

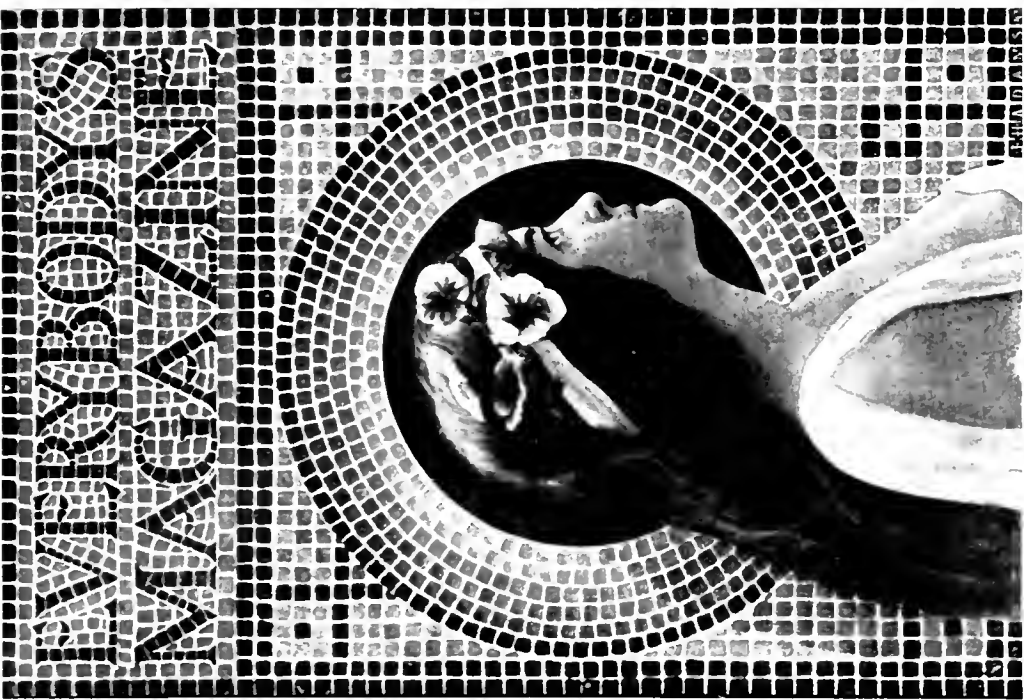


FIG. 25



Allen Drew Cook
Poster design. Untouched negative, from life



The Holy Women at the Way of the Cross

PLATE XI



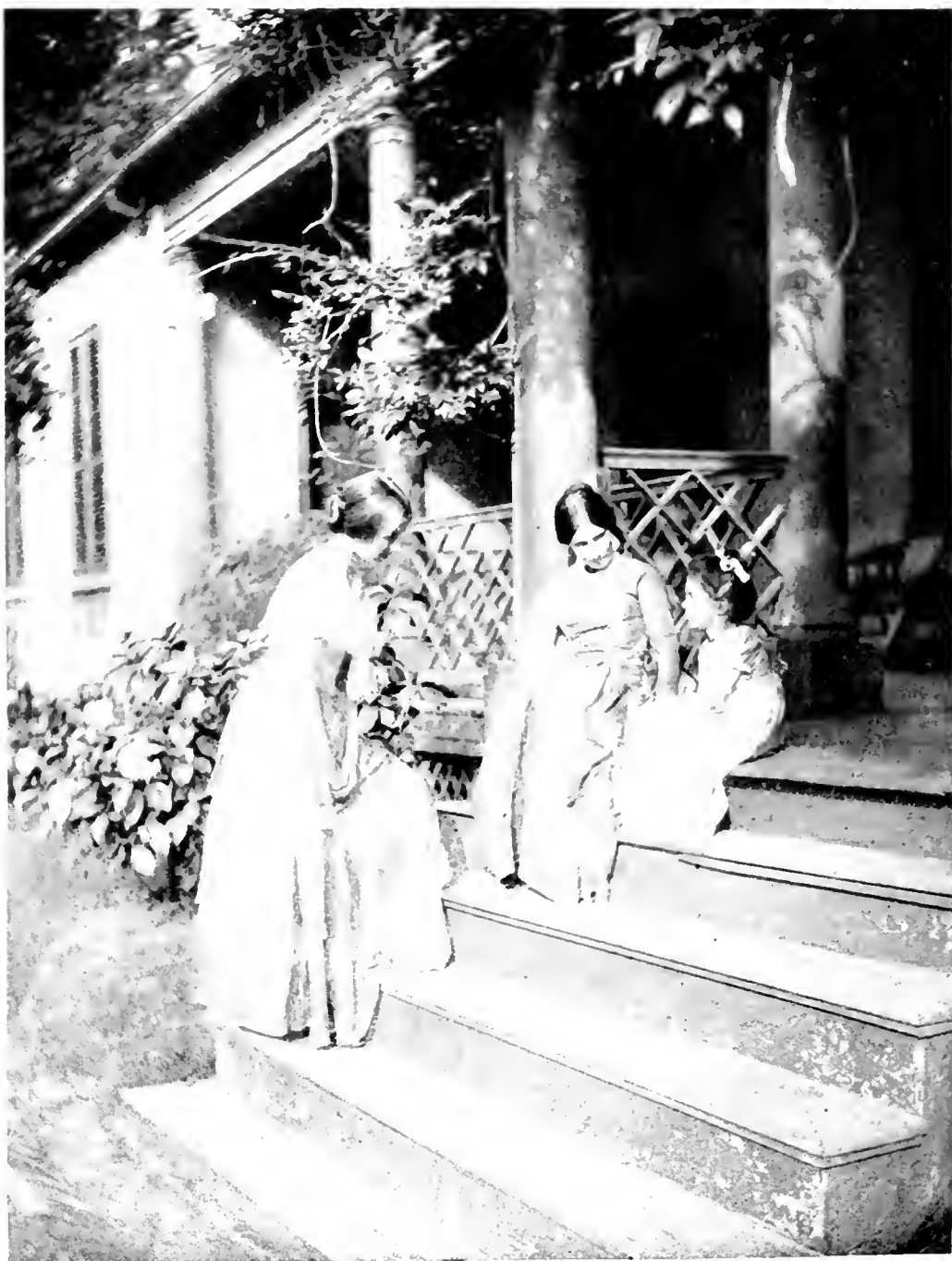
Portrait: Eduard J. Steichen

PLATE XII



The Staircase: Clarence H. White

PLATE XIII



Olden Days: By Mrs. Jeanette Bennett

PLATE XIV



A MEXICAN
Sarah C. Sears



W. F. James 1901

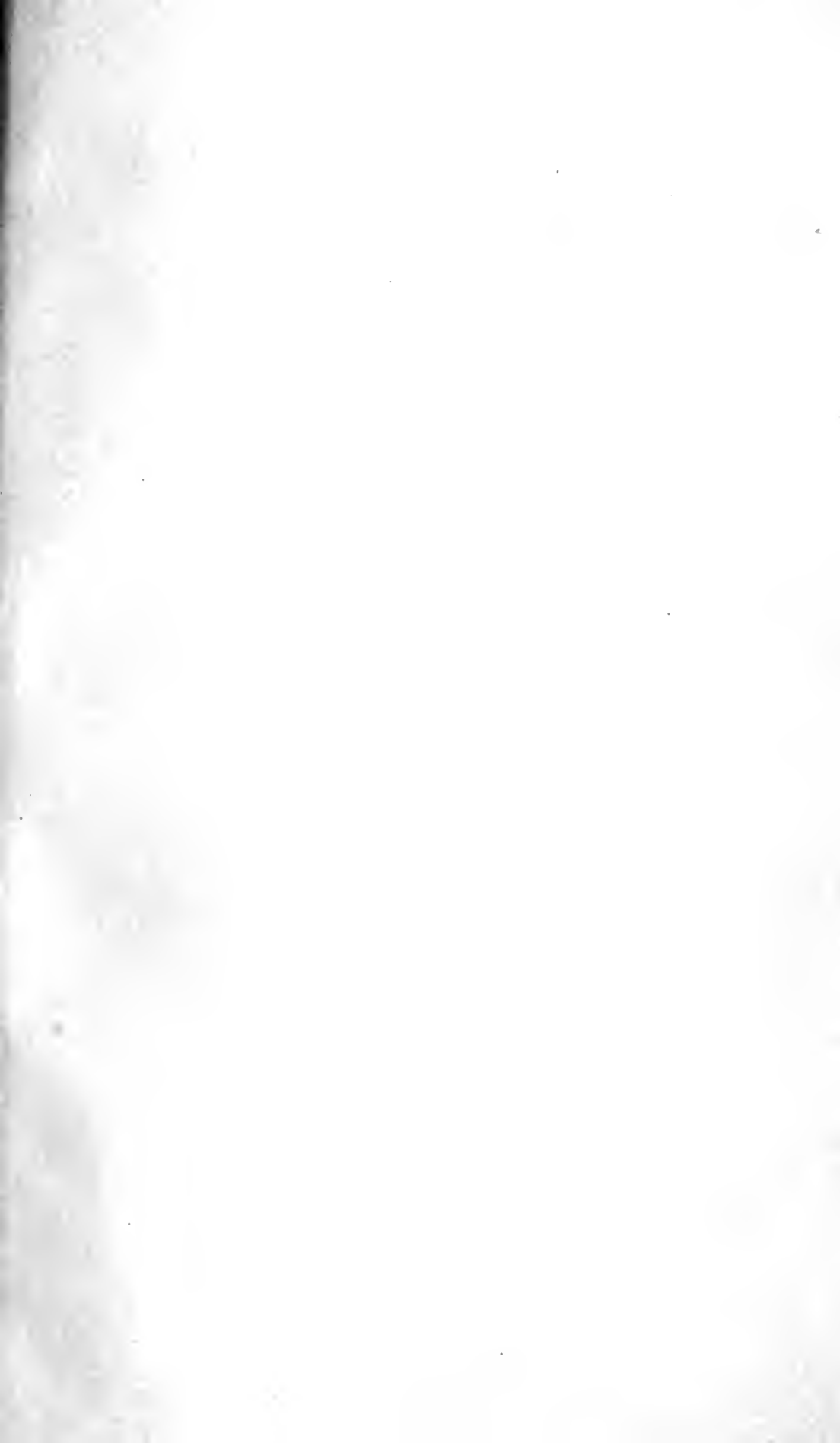
CHICAGO RIVER
W. F. James

TITE DRAGON
Alvin Langdon Coburn





A SUMMER AFTERNOON

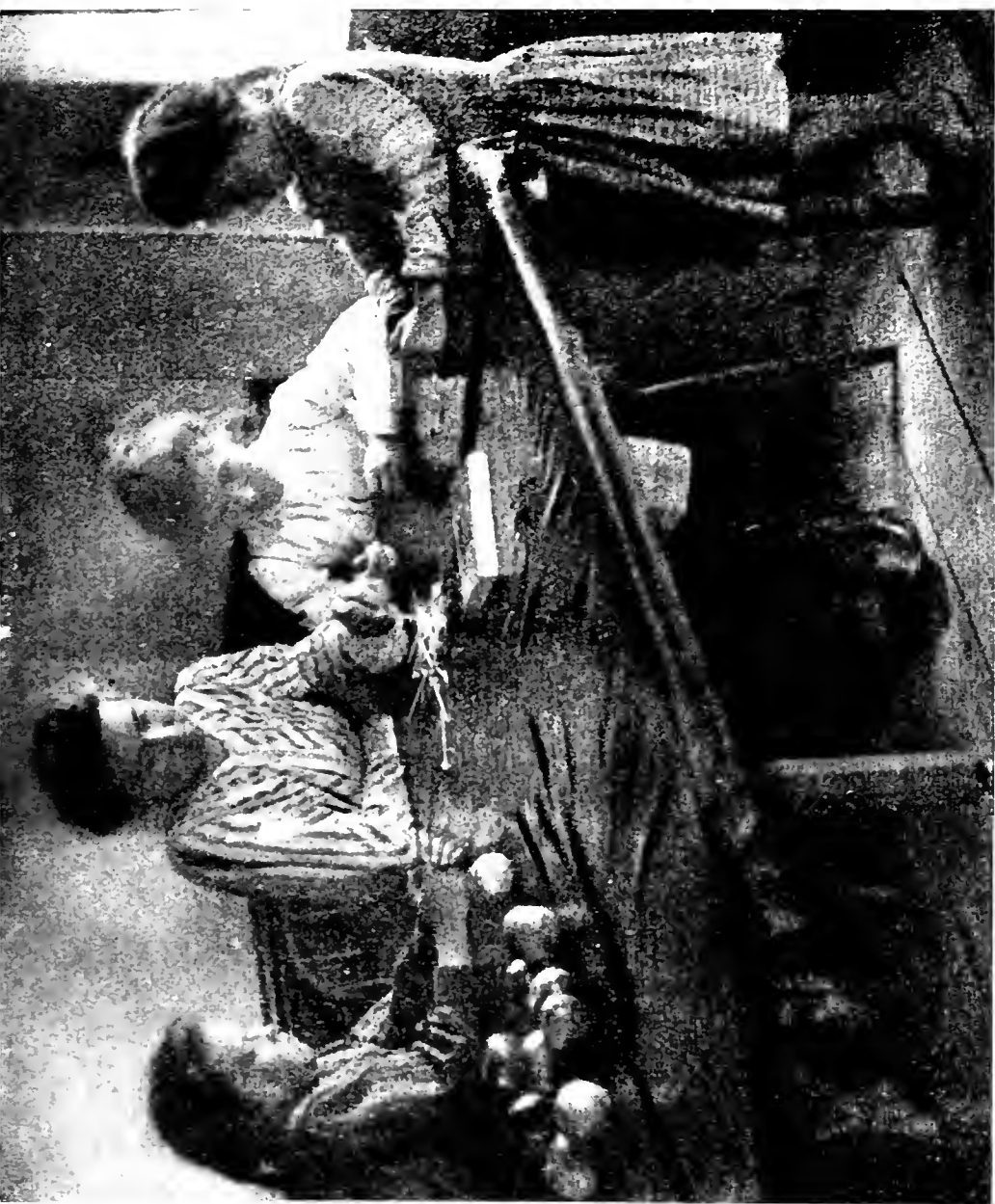




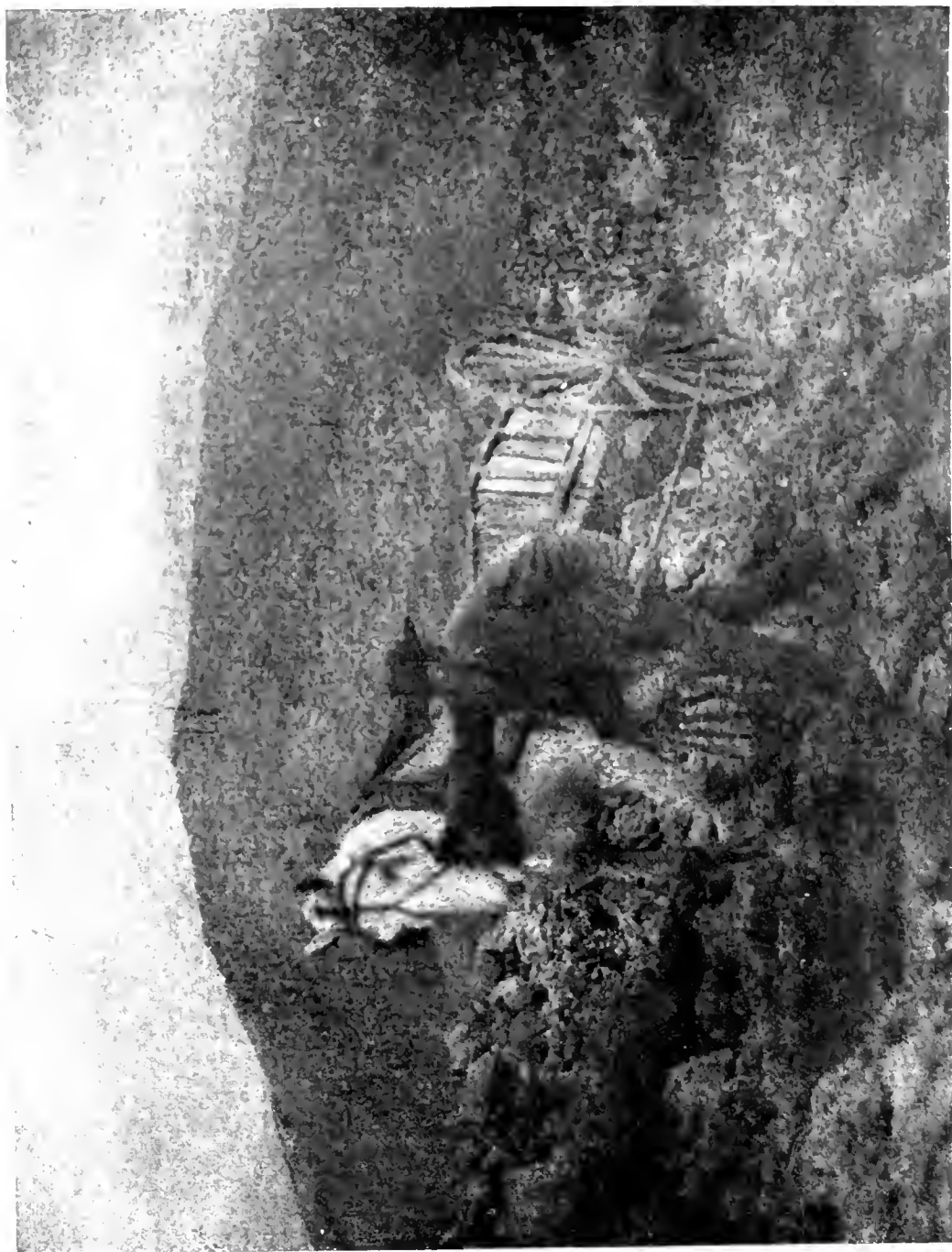
OLD WILLOW ROAD

Ralph E. Brown

First American Salon



JACKSTRAWS
Curtis Bell



THE ROAD-MENDER
C. M. Shipman



A JAPANESE LANDSCAPE
Rudolph Eickemeyer, Jr.

Copyright, 1904, by R. H. Russell, New York



SCARCE TRODDEN PATHS

A. W. Chaffee

First American Salon



A SUMMER SEA
Rudolph Eickemeyer, Jr.

Copyright, 1903, by the Campbell Art Co., New York



BY THE WAYSIDE
Rudolph Eickemeyer, Jr.

Copyright, 1901, by R. H. Russell, New York



POLISHING BRASS
Myra Albert Wiggins



PORTRAIT
Sarah C. Sears



STUDY
Sarah C. Sears



LIFE'S WINTER
Carl Rau

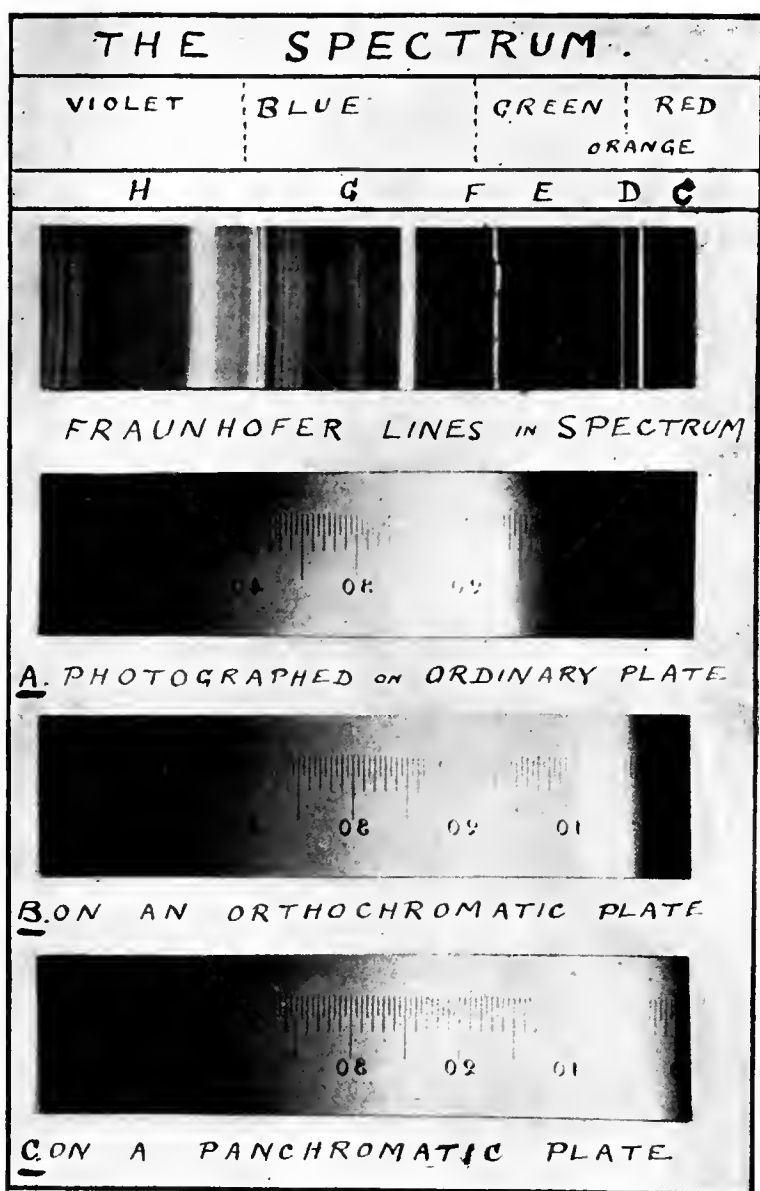


FIG. 3 (See page 379)







Physical &
Applied Sci.
Serials

Photo - miniature

Author

6.

Title

UNIVERSITY OF TORONTO
LIBRARY

Do not
remove
the card
from this
Pocket.

Acme Library Card Pocket
Under Pat. "Ref. Index File."
Made by LIBRARY BUREAU

